**NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE**

**SINGLE TECHNOLOGY APPRAISAL**

**Adalimumab for treating moderate to severe hidradenitis suppurativa [ID812]**

The following documents are made available to the consultees and commentators:

1. **Response to consultee, commentator and public comments on the Appraisal Consultation Document (ACD)**

2. **Consultee and commentator comments on the Appraisal Consultation Document** from:
   - AbbVie
   - The Hidradenitis Suppurativa Trust, *written by patient expert Tara Burton*
   - British Association of Dermatologists, *written by clinical expert Dr John Ingram, endorsed by the Royal College of Physicians*

3. **Comments on the Appraisal Consultation Document from experts:**
   - Ceri Harris, Patient Expert, nominated by The Hidradenitis Suppurativa Trust

4. **Comments on the Appraisal Consultation Document received through the NICE website**

5. **Additional evidence as requested in the ACD** submitted by AbbVie
   - Results from network meta-analysis of outcomes used in the cost-effectiveness model – revised base case
   - Results from network meta-analysis of outcomes used in the cost-effectiveness model – scenario analyses

*6.* **Evidence Review Group critique of additional evidence** submitted by AbbVie

*Any information supplied to NICE which has been marked as confidential, has been redacted. All personal information has also been redacted.*

# NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

## Single Technology Appraisal

## Adalimumab for treating moderate to severe hidradenitis suppurativa

## Response to consultee, commentator and public comments on the Appraisal Consultation Document (ACD)

**Definitions:**

**Consultees –** Organisations that accept an invitation to participate in the appraisal including the companies, national professional organisations, national patient organisations, the Department of Health and the Welsh Government and relevant NHS organisations in England. Consultees can make a submission and participate in the consultation on the appraisal consultation document (ACD; if produced). All non-company consultees can nominate clinical experts and/or patient experts to verbally present their personal views to the Appraisal Committee. Company consultees can also nominate clinical experts. Representatives from NHS England and clinical commissioning groups invited to participate in the appraisal may also attend the Appraisal Committee as NHS commissioning experts. All consultees have the opportunity to consider an appeal against the final recommendations, or report any factual errors, within the final appraisal determination (FAD).

**Clinical and patient experts and NHS commissioning experts** – The Chair of the Appraisal Committee and the NICE project team select clinical experts and patient experts from nominations by consultees and commentators. They attend the Appraisal Committee meeting as individuals to answer questions to help clarify issues about the submitted evidence and to provide their views and experiences of the technology and/or condition. Before they attend the meeting, all experts must either submit a written statement (using a template) or indicate they agree with the submission made by their nominating organisation.

**Commentators –** Commentators can participate in the consultation on the ACD (if produced), but NICE does not ask them to make any submission for the appraisal. Non-company commentator organisations can nominate clinical experts and patient experts to verbally present their personal views to the Appraisal Committee. Commentator organisations representing relevant comparator technology companies can also nominate clinical experts. These organisations receive the FAD and have opportunity to report any factual errors. These organisations include comparator technology companies, Healthcare Improvement Scotland any relevant National Collaborating Centre (a group commissioned by NICE to develop clinical guidelines), other related research groups where appropriate (for example, the Medical Research Council and National Cancer Research Institute); other groups such as the NHS Confederation, the NHS Commercial Medicines Unit, the Scottish Medicines Consortium, the Medicines and Healthcare Products Regulatory Agency, the Department of Health, Social Services and Public Safety for Northern Ireland).

**Public –** Members of the public have the opportunity to comment on the ACD when it is posted on the Institute's web site 5 days after it is sent to consultees and commentators. These comments are usually presented to the appraisal committee in full, but NICE reserves the right to summarise and edit comments received during consultations, or not to publish them at all, where in the reasonable opinion of NICE, the comments are voluminous, publication would be unlawful or publication would be otherwise inappropriate.

**Please note:** Comments received in the course of consultations carried out by NICE are published in the interests of openness and transparency, and to promote understanding of how recommendations are developed. The comments are published as a record of the submissions that NICE has received, and are not endorsed by NICE, its officers or advisory committees.

## Comments received from consultees

| Consultee | Comment [sic] | Response |
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| AbbVie | **Has all of the relevant evidence been taken into account?**<br>Symptoms experienced by patients with HS include recurrent inflamed lesions, pain, burning, itching and an odorous discharge.[3] These symptoms have a devastating impact on patients' lives both psychologically (e.g. embarrassment, stigma) and physically (e.g. restricted movement, leisure and activity).[4,5]<br>The skin is the largest visible part of the body and as well as playing an important role for psychological and physical functioning, it plays a key role for self-esteem and perception of self-image. Therefore, the symptoms of HS are much more than just the physical appearance of abscesses, fistulas and scarring. Esmann et al., (2001) concluded that HS has a large emotional impact on patients resulting in social isolation due to fear of stigmatization.[4] Shame and irritation are also feelings frequently expressed by HS patients relating to smells, scars, itching and pain.[4] Furthermore, HS has been associated with social isolation and difficulty in developing intimate relationships. [4]<br>Many patients with HS also deal with additional psychological complications such as embarrassment and depression.[5] Using the Major Depressive Index (MDI) tool, the proportion of HS patients with depression was estimated at 9%; approximately twice that of the general population.[6] Another study showed that up to 21% of individuals with HS may have co-existent depression, according to the Beck Depression Inventory-Short Form (BDI-SF).[7] A post-hoc analysis of the adalimumab Phase II HS trial also confirmed a high rate of depression, with overall 64 of 154 patients (41.6%) reporting co-morbid depression.[8] This was comparable to another study (n=90) which reported 38.6% of HS patients affected by depression, as measured by the Hospital Anxiety and Depression Scale (HADS).[9]<br>Because of the high psychological burden observed in HS patients the benefit of a reduction in disease activity on the overall psychological status of these patients might not be realised immediately and as such AbbVie agrees with the conclusion of the ACD that "Improvements in the psychological burden of hidradenitis suppurativa may not be captured in the QALY calculations, because there is a time lag between | Comments noted. |

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| | reducing disease activity and seeing a benefit on patient-reported outcomes".<br>HS is also associated with a number of inflammatory diseases, including inflammatory bowel disease, spondyloarthropathies and pyoderma gangrenosum. Squamous cell carcinoma rates are also higher in patients with HS than the general population.[10] Patients with HS also have an increased risk of metabolic syndrome and suicide compared with the general population.[4,11,12] The clinical experts consulted during the appraisal committee meeting also "noted that hidradenitis suppurativa is associated with increased mortality, which can be a result of physical complications such as sepsis, or people taking their own lives".<br>Since the additional improvements in the psychological burden of hidradenitis suppurativa may not have been captured in the QALY calculations and due to the potential impact on mortality (from HS directly ie., suicide or complications due to HS surgery) not being considered in the economic analysis, AbbVie believes that the ICERs upon which the recommendations have been based are likely to be overestimates. | |
| AbbVie | **Are the summaries of clinical and cost effectiveness reasonable interpretations of the evidence?**<br>The ACD does not reasonably interpret some elements of cost-effectiveness associated with adalimumab.<br>***The ERG underestimates the cost of surgical-inpatient admissions***<br>The European guidelines published in 2015 recommend medical treatment either as monotherapy or in combination with radical surgery for widely spread lesions and surgery/laser for locally recurring lesions. Laser treatment is a potential treatment option early in the course of the disease. Surgery to remove unresponsive lesions is an option, local excision early in the disease and wide surgical excision later in the treatment pathway.[13] Wide surgical excision is generally used in patients with more advanced disease; the skin areas affected by HS are removed in extensive skin surgery and the wounds are left to secondary healing, which can take up to 3 months. Although surgery may offer benefits in terms of patient satisfaction[14] and HRQoL improvements,[15] it increases the risk of infection, excessive bleeding, pain, prolonged healing and further scarring. In addition, surgery is associated with a high rate of recurrence and as it only treats the disease locally, it does not prevent the reappearance of lesions in other locations which means that patients may require multiple surgeries over time. [15,16]<br>An observational cross-sectional study funded by AbbVie retrospectively reviewed patient notes for 101 patients from 10 UK hospitals for the 5 years prior to July 2014-April 2015.[17] Of those patients, 41% had surgery (86 surgeries over 5 years). | The FAD has been amended to reflect the discussions about the cost of surgical-inpatient admissions at the second appraisal meeting – see FAD sections 4.12 and 4.13. |

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| | Of the 86 surgeries 13.9% (n=12) had surgical complications, and 34.1% (n=14) had recurrent surgery most of which was at the same site (78.6%, n=11). The median time to next surgery was 5 months and the median time to recurrence of disease was 10.2 months (range 0.2 -66 months).<br><br>Market research including 315 patients with HS revealed that 79% of patients required surgical intervention as part of their disease management. Although local incision and drainage was the most common procedure, 38% of patients also reported having wide excisions. The common reasons cited by patients for wide excisional surgery was to reduce pain, to clear HS symptoms, and to reduce the impact of HS on their daily life.[18]<br><br>The clinical experts consulted during this submission *"noted that people with hidradenitis suppurativa will have repeated and extensive surgeries over their lifetime, which is burdensome"*. The clinical experts also suggested that "*the ERG's alternative assumptions about surgical procedures may have underestimated the costs, but could not present any alternative estimates".*<br><br>The ERG estimated a total cost of surgery of £1,525.74. This estimate assumed that 67% of all HS surgeries were intermediate procedures which were undertaken in a day case setting and that of the remaining HS surgeries, patients were assumed to have an average of 2 wide excisions over their lifetime (6%) with all the other remaining surgeries (27%) comprised of an equal mix of elective and non-elective intermediate skin procedures with an average length of stay (LOS) of 2 days.[19]<br><br>AbbVie believes that the assumptions used by the ERG to estimate the cost of surgical-inpatient admissions are an underestimate due to the following reasons:<br><br>1) The ERG assumed that 67% of all HS surgeries were intermediate procedures which were undertaken as a day case, however the value extracted by the ERG from the HES study "Secondary care management of hidradenitis suppurativa in England: A description of national patient pathways and resource use using hospital episode statistics data from 2007-2013" refers only to the patients who had a first recorded inpatient HS diagnosis code (index spell) during the study period. Instead the total number of inpatient spells reported during the study period was [redacted], of which [redacted] were elective admissions, [redacted] were non-elective and 31,875 were day cases (which indicates that the value used by the ERG in their calculations overestimates the proportion of day cases and as a result underestimates the total cost of surgical-inpatient admissions). [20]<br><br>2) Based on clinical expert opinion and market research data conducted by AbbVie it is unlikely that moderate to severe HS patients would only have on average 2 wide surgical excisions over their lifetime.<br><br>As such AbbVie believes that the alternative assumption about the cost of surgical- | |

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| | inpatient admissions used in the ERG's base case represent an underestimate of the cost of surgery for HS and as such including this in the cost effectiveness model overestimates the ICER.<br>The full list of references is not included here. These are presented in the AbbVie response to consultation, which can be found in the Committee papers. | |
| AbbVie | **Are the summaries of clinical and cost effectiveness reasonable interpretations of the evidence?**<br>The ACD does not reasonably interpret some elements of cost-effectiveness associated with adalimumab.<br>***Cost effectiveness results based on PIONEER II only***<br>The base case analysis used data from both Phase III pivotal trials (PIONEER I and II), however utility data was only available from one study (the PIONEER II clinical trial collected EQ-5D information as a measurement of HRQoL, while the PIONEER I trial did not collect EQ-5D data). As such AbbVie also presented a scenario analysis where data from only one trial, PIONEER II, was used. This resulted in an ICER which was higher than that presented in the base case analysis. The ACD states that *"the ICER for adalimumab increased to about £36,400 per QALY gained compared with supportive care (based on a deterministic analysis) when the efficacy data from PIONEER I data were excluded. The committee considered that this was counter-intuitive because the benefit with adalimumab was smaller in PIONEER I than in PIONEER II. This supported the committee's concerns about the company's inconsistent use of data sources instead of a meta-analysis, which contributed to the structural uncertainties in the model".*<br>The treatment effect observed in PIONEER I was smaller than that observed in PIONEER II. However the reason for the increase in the ICER can't be attributed to the inconsistent use of data sources instead of a meta-analysis as suggested by the Committee. The main reason for the difference in results is due to the fact that the proportion of patients responding to treatment with adalimumab is higher in PIONEER II compared to PIONEER I and, as a result, more patients continue treatment with adalimumab in the cost effectiveness model after week 12 (thus increasing the overall cost of treatment which increases the ICER).<br>As such AbbVie does not believe that the cost effectiveness results are counter-intuitive when only results from the PIONEER II are used in the cost effectiveness model. | Comments noted. The text in section 4.13 of the ACD was unclear and has been misinterpreted. When describing the results as "counterintuitive", the committee was referring to the reduction in the incremental quality-adjusted life years (QALYs) in the scenario analysis, rather than the increase in the incremental cost-effectiveness ratio (ICER). The committee considered it counterintuitive that adalimumab produced a lower QALY gain when the results from PIONEER I were excluded. This statement has been removed from the FAD because this scenario was not considered relevant when the committee were identifying the most plausible ICER (see FAD section 4.17). |
| AbbVie | **Are the recommendations sound and a suitable basis for guidance to the NHS?** | In its first appraisal meeting, the committee concluded that adalimumab may provide additional gains in health-related quality of life over those |

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| | Due to the points discussed above, AbbVie does not believe that the provisional recommendations are sound or a suitable basis for guidance to the NHS.<br>AbbVie believes that the Committee preferred base case overestimates the ICER by using a lower cost of surgery and by not taking into account the additional psychological benefit that adalimumab could provide (which are not currently captured in the QALY calculations). Furthermore the current analysis does not capture the potential benefits of adalimumab in improving work productivity which would be expected to be significant for HS patient considering that they are usually diagnosed in their early 20s.<br>There is a clear unmet need for an effective licensed HS treatment in the UK for patients with moderate to severe HS. Adalimumab is the only licensed treatment for moderate to severe HS and represents a step change in the management of HS compared to current standard of care. Results from the pivotal Phase III trials (PIONEER I and II) have demonstrated that adalimumab significantly reduces the number of inflammatory lesions in HS patients, thereby reducing pain and improving overall HRQoL of patients with moderate to severe HS. Adalimumab has the potential to delay and prevent HS from developing to a stage where extensive skin surgery will be required or surgery might not be possible due to skin damage. | included in the quality-adjusted life year (QALY) calculations, for example psychological benefits – see ACD section 4.14 (corresponding to FAD section 4.18).<br><br>The NICE reference case stipulates that the perspective on outcomes should be all direct health effects. If the inclusion of a wider set of costs or outcomes is expected to influence the results significantly, such analysis should be presented in addition to the reference case analysis. Productivity costs are not included in either the reference-case or non-reference-case analyses; see section 5.1.7–5.1.10 of the Guide to the methods of technology appraisal. However, the committee heard that returning to work has an important positive impact on psychological well-being and feelings of self-worth. The FAD has been amended to reflect this – see FAD section 4.18.<br><br>The FAD has also been amended to reflect the discussions about the cost of surgical-inpatient admissions at the committee's second appraisal meeting – see FAD sections 4.12 and 4.13. |
| AbbVie | **Factual inaccuracies identified in the ACD: page 15 Section 3.18**<br>**Description of inaccuracy**<br>*"The ICER for adalimumab was greater than £20,000 per QALY gained, compared with supportive care, in the following scenarios:*<br>*time horizon shortened to 20 years or 30 years*<br>*data from PIONEER I excluded (model used only PIONEER II)*<br>*different imputation rule for missing data"*<br>**Suggested amendment**<br>*"The ICER for adalimumab was greater than £20,000 per QALY gained, compared with supportive care, in the following scenarios:*<br>*time horizon shortened to 20 years or 30 years* | Comment noted; NICE agrees that this was a factual inaccuracy in the ACD. NICE agrees that AbbVie's suggested amendment is accurate, but this statement has been removed from the evidence section of the FAD because these scenarios were not considered relevant to the committee's decision-making after the company submitted its revised base case. |

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| | □ *data from PIONEER I excluded (model used only PIONEER II)*<br>□ *different extrapolation method "* | |
| AbbVie | **Factual inaccuracies identified in the ACD: page 15 Section 3.18**<br>**Description of inaccuracy**<br>*"It noted that the ERG's alternative calculation of transition probabilities beyond week 36 (in which extrapolation was based on data from the PIONEER trials and missing data were handled consistently) did not have a material effect on the ICER".*<br>The scenario analysis in which extrapolation is only based on data from the PIONEER trials lowers considerably the ICER (pg. 195 Table 63 of submission of evidence).<br>**Suggested amendment**<br>*""It noted that the ERG's alternative calculation of transition probabilities beyond week 36 (different imputation rule for missing data) did not have a material effect on the ICER".* | Comment noted. This statement has been removed from the FAD because this scenario was not considered relevant when the committee were identifying the most plausible ICER (see FAD section 4.17). |
| British Association of Dermatologists | **Has all of the relevant evidence been taken into account?**<br>We note that RCT data regarding adalimumab 40mg weekly therapy compared to placebo is also available from the phase II trial (Kimball et al 2012). Could any of this data be added to the results of PIONEER I and II for the purposes of modelling, or is this prevented by lack of HiSCR outcome data? | Comment noted. The Hidradenitis Suppurativa Clinical Response (HiSCR) outcome was not a pre-specified endpoint in the phase II trial (M10-467). |
| British Association of Dermatologists | There is some confusion about the source of evidence for current hidradenitis suppurativa (HS) clinical practice in the UK. Two surveys have been conducted but in some places are not differentiated:<br>1. Ingram JR, McPhee M. Management of hidradenitis suppurativa: a UK survey of current practice. Br J Dermatol 2015; 173: 1070-2.<br>2. Abbvie-sponsored survey of management of moderate to severe HS, the full results of which have not yet been published in a peer reviewed journal.<br>The survey by Ingram and McPhee sets out the order of most frequently used medical therapies for HS (however note that while isotretinoin is included, evidence suggests that this is ineffective for most HS patients). The survey sponsored by Abbvie was used by the company to estimate the number of surgical procedures required in a HS patient's lifetime. | The FAD has been amended to reflect this – see FAD section 4.2. |
| British Association of Dermatologists | **Are the summaries of clinical and cost effectiveness reasonable interpretations of the evidence?** | The FAD has been amended to reflect the appraisal committee's further discussions about the cost of |

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| | Yes, the summaries are comprehensive and reasonable. The report includes the issue of uncertainties surrounding surgery for HS, which remains difficult to estimate accurately. In particular, it may be that three or four wide excisions are required on average during the lifetime of a patient with moderate to severe HS, rather than the estimate of two wide excisions included in the ERG report.<br>In terms of further clarification of the surgery and wound care issues, reduction in suppuration in those patients who respond to adalimumab should decrease wound dressings costs, which can be a substantial component of the costs of supportive care. In addition there should be a reduction in the number of smaller procedures, such as incision and drainage and narrow margin excisions. It is uncertain whether there would be any change to the number of wide excisions because we do not have enough experience of how adalimumab will be used in practice, with the potential to use both adalimumab and wide excision surgery in some patients. | surgical-inpatient admissions and the effect of adalimumab on this cost – see FAD sections 4.12 and 4.13.<br>The cost of dressings is reflected in section 4.18 of the FAD. |
| British Association of Dermatologists | **Are the recommendations sound and a suitable basis for guidance to the NHS?**<br>Regarding stopping rules, we agree that it is reasonable to continue adalimumab treatment for partial response, defined as a 25-50% reduction in inflammatory lesions, with no increase in abscesses or draining fistulas. We also agree that it is inappropriate to continue treatment for a further 12 weeks in non-responders, defined as a reduction of less than 25% in the number of inflammatory lesions. It is counterintuitive that, in the pharmacoeconomic model, removal of the rule to continue adalimumab therapy for 12 weeks in non-responders made adalimumab less cost effective.<br>The BAD wishes to stress that moderate to severe HS represents a large unmet patient need in the NHS, particularly when surgery is impractical due to involvement of several different skin regions. At the moment, clinicians are required to submit individual funding requests for anti-tumour necrosis factor alpha (anti-TNFα) therapies to treat HS, which generates inequalities in HS care provision across the UK. Anti-TNFα therapy represents a step change in HS care and adalimumab is currently the only licenced intervention available for HS. | Regarding the comment "It is counterintuitive that, in the pharmacoeconomic model, removal of the rule to continue adalimumab therapy for 12 weeks in non-responders made adalimumab less cost effective" NICE is unclear about the basis for this conclusion; the removal of the rule to continue adalimumab therapy for 12 weeks in non-responders was not modelled in the company's original submission or in the ERG's original exploratory analyses. The committee considered that the ICER for adalimumab would reduce (that is, the cost effectiveness of adalimumab would increase) if people whose disease was not responding to treatment after 36 weeks stopped treatment immediately (see ACD section 4.13). The committee requested that the company remove this rule in its revised base-case analysis; see section 3.25 of the FAD for the results of the company's revised base case. |
| Hidradenitis Suppurativa Trust | While a range of other treatments are used to try to obtain a disease control there is no evidence to suggest a preferred method of treatment, and no other treatment is currently licenced for use for HS patients. This cause's extreme frustration to both healthcare professionals and patients as there is no robust evidence to indicate which would be a preferred method of treatment, meaning a lengthy trial and error process for the patient which in turn increases the stress that HS patient's face | Comments noted. The views of clinical experts and patient representatives were considered by the appraisal committee when formulating its recommendations. |

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| | which could have a detrimental psychological impact. | |
| Hidradenitis Suppurativa Trust | I note that the cost of surgical-inpatient admissions was a key driver for cost effectiveness, but I also wonder whether it would be fair to include the trial and error basis of other treatments (orally and topical) that HS patients are frequently having to undertake. If a patient was able to obtain disease management using Adalimumab then the need for antibiotics, oral immune suppression therapies, and vitamin A derrivatives, such as, Isotetrinoin and even dressings and topical treatments would lessen. These extra costs which are all associated with HS patients would not be as high if disease control was obtained. There are also costs associated with psychological implications due to chronic disease burden that may be able to be alleviated once disease control has been established. | Comments noted. The committee concluded that adalimumab may provide additional gains in health-related quality of life over those included in the quality-adjusted life year (QALY) calculations, for example psychological benefits – see FAD section 4.18. |
| Hidradenitis Suppurativa Trust | I note and understand the importance of having appropriate clinical comparators for Adalimumab, however this is a very difficult area to address fully, and also a frustrating one, as every route of treatment differs, and I note that the committee questioned whether infliximab would be an appropriate comparator (4.3). Through my work for the HS Trust, and the connections that I have with patients throughout the UK, I am being informed that infliximab is being withdrawn from patients and patients are being told that this is no longer an option. HS patients will no longer be offered this as a possible treatment, and those currently on this medication will be taken off imminently. HS patients are now left in limbo. Patients literally have nothing to help guide them through this difficult journey and some feel that by going through this trial and error approach with medications does not help, but more so hinder them, with possibly future implications, for instance, building up a resilience to antibiotics etc | Comments noted. |
| Hidradenitis Suppurativa Trust | I note that the committee did not did not consider an added benefit of Adalimumab may be to reduce the need for surgery as there is no related evidence (4.14), however due to the all-round lack of information surrounding HS and treatments is it fair to reach such conclusions? Could another scenario also be assumed that by obtaining disease control this may provide an opportunity to have surgery to eradicate troublesome areas, which in the long term may prevent the need for any future surgery and will improve the quality of life and even allow a disabled person to return to work? | The FAD has been amended to reflect this – see FAD sections 4.13 and 4.18. |
| Hidradenitis Suppurativa Trust | It is clear that there are still many uncertainties that surround HS, particularly surrounding treatment and long term approaches for disease management, but from a patient's perspective, is it viable to NOT recommend adalimumab? By having adalimumab recommended, it may enable an improved quality of life which may include the following benefits to an individual;- | Comments noted. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe |

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| | • Less pain<br>• Less wound care<br>• Lower need for other medical interventions<br>• Improved social life<br>• Improved work life<br>• Improved personal life<br>• Improved relationships<br>• Family development opportunities<br>• Improved psychological well being<br>• Back to employment/work life – enabling better career opportunities<br>• Feelings of hopefulness, confidence, self-worth improve<br>• Less disease burden<br>• More time for other activities due to less time needed for wound care/cleaning/dressing/preparing<br>• Lower disease burden on carers/family/friends<br>• Less need for primary care interventions nursing/wound clinics/pain clinics/community nursing etc<br><br>Having a medicine licenced for use with HS, but then not recommended to be used will be soul destroying to patients. Like all medications it may not be for everyone, but to just have it as an option is life changing. This is a pinnacle moment for HS patients, carers, family and friends as this disease affects a much wider number of people. | hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |
| Hidradenitis Suppurativa Trust | I also wonder whether the long term role of adalimumab has been taken into consideration. Some HS patients may enter a natural remission state, or symptoms may calm post menopause for some women, and therefore opportunities may arise where patients can wean off of adalimumab if disease control or remission has been established. Therefore the need for continued use is not required, or the need for less frequent use may arise. | The FAD has been amended to reflect this – see FAD section 4.1. |
| Royal College of Physicians | We would like to formally endorse the response submitted by the British Association of Dermatologists. | Comments noted. |

## Comments received from clinical experts and patient experts

| Nominating organisation | Comment [sic] | Response |
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| Hidradenitis Suppurativa Trust | I have attempted to read though all the documentation, it is a weighty document and contains a lot of clinical and statistical jargon which is not my forte, even so the main areas of interest for me is the current recommendation that it will not be recommended.<br><br>As someone who lives with this condition I am deeply concerned that without the approval, many people with HS will simply be left with no treatment, living very painful, isolating lives and not be able to partake in activities that the rest of the population take for granted.<br><br>The reality for someone with HS is access to any support or treatment is a postcode lottery dependant on the clinical awareness of HS of the GP/Consultant/Doctor they come into contact with.<br><br>I currently run the [redacted] HS support group and what quickly becomes apparent sadly is the 'brushing off' people with HS experience when trying to get a referral from their GP to a specialist. Often been told, sorry you have HS there is nothing we can do, here is some Hipiscrub. This is our reality. Those that are fortunate to have a good GP, there is a long slow process of referral and then you feel like you have to go through a cycle of trying every medication known to man to try and get some relief. So that's drugs for acne, leprosy and organ rejection, nothing that is identified for HS specifically. This lack of value to our plight and condition can be very distressing.<br><br>So when we were told last July that Adalimumab was licensed for HS, it was like a ray of sunlight. It meant that those who were stage 2 and 3 could go to their GP and name a medication that could help. They would still have to go through hoops but it validates their condition and the pain and suffering they have experienced.<br><br>I realize my concerns raised here are simply emotional, and what you need are hard facts, statistics and clinical outcomes. Which I feel Abbvie did not provide at the outset, which I personally feel very frustrated about as let down. But my plea and those of many suffering with HS is please, give us a chance, give us a choice and give us hope.<br><br>I am currently on Infliximab, and have been for 6 months, it has made such a difference to me and my condition, with large portions of time pain free. But if the treatment starts to impact on my health and no longer work or I have a reaction and need to stop, this means I have run out of options. All I | Comments noted. The views of clinical experts and patient representatives were considered by the appraisal committee when formulating its recommendations.<br><br>The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |

| Nominating organisation | Comment [sic] | Response |
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| | will have is surgery and cudely have lumps cut out of me. As a result I will need time off work, potentially lose my job and be reliant on benefit. I am a single parent who fought to educate myself, putting myself through university as a mature student to better the life of my child and our future. This would be a huge step backwards for me and soul destroying.<br>This may seem dramatic to you, but this is my life and the lives of 1-100 people living with HS. You have the power to give them hope and treatment, please think very hard before you make the decision to not recommend this treatment. | |

## Comments received from members of the public

| Role* | Comment [sic] | Response |
|---|---|---|
| Patient 1 | I've suffered HS for 17 years now and my quality of life well basically I don't have a life I am in pain every single day I miss doing things with my children because I have numerous open wounds over my body I live with the embarrassment of this every day of my life where I leak through my clothes on my bed,sofas etc if there is a slight glimmer of hope that something could help someone in my position possible have a little bit of a better quality of life I'm disappointed it's being considered to be stopped we need some kind of hope this diesease will get better one day. | Comments noted. The views of patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |

* When comments are submitted via the Institute's web site, individuals are asked to identify their role by choosing from a list as follows: 'patient', 'carer', 'general public', 'health professional (within NHS)', 'health professional (private sector)', 'healthcare industry (pharmaceutical)', 'healthcare industry'(other)', 'local government professional' or, if none of these categories apply, 'other' with a separate box to enter a description.

| Role* | Comment [sic] | Response |
|---|---|---|
| Patient 2 | HS patients are often isolated and neglected due to the lack of medical support. There needs to be an appropriate patient pathway where we are considered as patients still. Hs effects me personally in a lot of way from work like to home life with my partner and son. I feel it stops me doing daily jobs some times and with my job role also stops me from being able to do this without horrific pain! Please support this! | Comments noted. The views of patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |
| Patient 3 | Absolutely ridiculous! You are limiting what very few options we have and making it near on impossible to obtain funding - this has worked for patients over years which can be obtained from personal accounts. This decision needs to be reversed. | Comments noted. The views of patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |
| Patient 4 | After it has been recognised that Hhmira can benefit those with the debilitating disease hidradenitis suppurativa it is sad that you are considering removing this again, if it can give relief and has already to sufferers I would appreciate you reviewing this decision, I have this disease and am at stage two, so far no drugs have worked for me and this may be an option for the future, and I am gutted to think it may not be available. | Comments noted. The views of patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |

| Role* | Comment [sic] | Response |
|---|---|---|
| Patient 5 | I was diagnosed with Hidradenitis Suppurativa in 1999 in my final year at university. I put my symptoms down to stress but I required surgery later that year and it was then I was informed I was suffering with HS and that I would need further surgeries in future. Currently I am near 50 surgeries, incuding flap grafts and split thickness grafts along with numerous excisions. I have been prescribed various drugs incuding, dapsone, rifampicin, isotretinoin and various antibiotics all without success. I was approved by NICE for Adaimumab and commenced treatment with noticeable reduction of flare ups. However, I needed to stop treatment for surgery and recently saw my dermatologist to discuss restarting the treatment. I was told of this meeting and its relevance to my recommencement of Adalimumab and I felt it necessary to include my input as a point of reference to your discussion on the future of treating hidradenitis Suppurativa. Please consider my only treatment at present of severe disease is inpatient surgery and base the cost against that of Adaimumab and its evidence based success from trials and patient reports. I am willing to discuss my situation further for clarification and to assist your need for information. | Comments noted. The FAD has been amended to reflect the discussions about the cost of surgical-inpatient admissions at the committee's second appraisal meeting – see FAD sections 4.12 and 4.13.<br>The views of patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |
| NHS Professional | Overall the decision not to approve would be very dissappointing. The authors do not seem to understand how devastating this condition really is. Furthermore in patients with severe HS there is no real indication in the review that currently there are no available treatments which work. The TNF inhibitors are the first drugs which have some impact on patients severely affected as most dermatologists who treat these patients will have seen. This drug should be made available to clinicians without the requirement for lengthy form-filling which completely stagnates the running of NHS work, and severely disadvantages patients. | Comments noted. The views of clinical experts and patient representatives were considered by the appraisal committee when formulating its recommendations. The committee considered the responses to the appraisal consultation document together with new evidence submitted by the company and agreed that adalimumab could be recommended for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional systemic therapy, and only if the company provides it with the discount agreed in the patient access scheme. |

## Comments received from commentators

None

**National Institute for Health and Care Excellence**

**Single Technology Appraisal**

# Adalimumab for treating moderate to severe hidradenitis suppurativa [ID812]

**AbbVie's Response to the Appraisal Consultation Document**

**11 March 2016**

## EXECUTIVE SUMMARY

AbbVie welcomes the opportunity to comment on the Appraisal Consultation Document (ACD).

AbbVie is disappointed with the preliminary decision not to recommend adalimumab within its marketing authorisation for treating moderate to severe hidradenitis suppurativa (HS) in people whose disease has not responded to conventional therapy.

HS has a considerable impact on a patient's health related quality of life (HRQoL) and activities of daily living. Given that the peak onset of HS is during the early 20s, HS can have a devastating impact on patients' lives: in forming relationships, ability to work and everyday activities.[1] Patients with HS also have to deal with psychological complications such as embarrassment and depression. Lack of awareness amongst the general public and in primary care delays presentation and diagnosis with HS patients experiencing significant delays in diagnosis (up to 12 years) during which they incur healthcare costs and undergo unnecessary treatments.[2]

Current HS treatments are used on an off-label basis and do not offer reliable disease control. There is limited published evidence on the effectiveness of these treatments and, therefore, clinical practice is driven primarily by expert opinion. Ineffective treatments can lead to the need for extensive surgery which can be associated with physical and psycho-social morbidities. A considerable number of HS patients who undergo surgical treatment experience disease persistence due to inadequate removal of involved tissue at the surgical site or due to the presence of disease at sites other than where surgery has been performed.

There is a clear unmet need for an effective licensed HS treatment. Adalimumab is the only licensed treatment for moderate to severe HS and represents a step change in the management of HS compared to current standard of care. Phase III randomised controlled trials have demonstrated that adalimumab significantly reduces the number of inflammatory lesions in HS patients, thereby reducing pain and improving overall HRQoL of patients with moderate to severe HS. Adalimumab has the potential to delay and prevent HS from developing into a stage where extensive skin surgery will be required or surgery might not be possible due to skin damage.

AbbVie's response to the ACD follows the general headings proposed by NICE for comments on the ACD.

AbbVie's position is that some of NICE's summaries of the cost effectiveness are not reasonable interpretations of the evidence provided and the following points will be discussed:

1. Cost of surgical-inpatient admissions

    - AbbVie believes that alternative assumptions about the costs of surgical-inpatient admissions used in the ERG's base case are an underestimate of the cost of surgery for HS. These assumptions result in an over estimate of the incremental cost-effectiveness ratio (ICER).

2. Cost effectiveness results using data from the PIONEER II trial only

    - AbbVie does not believe that the cost effectiveness results are counter-intuitive when only results from the PIONEER II trial are used in the cost effectiveness analysis and that the main reason for the increase in the ICER can be attributed to the higher treatment effect observed in PIONEER II.

As such AbbVie believes that the committee preferred base case overestimates the ICER by using a lower cost of surgery and by not taking into account the improvement in the psychological burden of hidradenitis suppurativa that adalimumab might provide to HS patients (not captured by the QALY in the current analysis). These points are further discussed within Section 1 and 2. Appendix 1 contains further points related to factual inaccuracies in the ACD.

We sincerely encourage the Committee to reconsider its draft guidance in light of these comments to the ACD and the additional evidence presented by AbbVie.

AbbVie believes that the new evidence presented as requested by the Committee demonstrates that adalimumab represents a cost effective use of NHS resources.

**Response to the content of the ACD under the general headings proposed by NICE for comments on the ACD**

**1. Has all of the relevant evidence been taken into account?**

**AbbVie Response:**

Symptoms experienced by patients with HS include recurrent inflamed lesions, pain, burning, itching and an odorous discharge.[3] These symptoms have a devastating impact on patients' lives both psychologically (e.g. embarrassment, stigma) and physically (e.g. restricted movement, leisure and activity).[4,5]

The skin is the largest visible part of the body and as well as playing an important role for psychological and physical functioning, it plays a key role for self-esteem and perception of self-image. Therefore, the symptoms of HS are much more than just the physical appearance of abscesses, fistulas and scarring. Esmann et al., (2001) concluded that HS has a large emotional impact on patients resulting in social isolation due to fear of stigmatization.[4] Shame and irritation are also feelings frequently expressed by HS patients relating to smells, scars, itching and pain.[4] Furthermore, HS has been associated with social isolation and difficulty in developing intimate relationships. [4]

Many patients with HS also deal with additional psychological complications such as embarrassment and depression.[5] Using the Major Depressive Index (MDI) tool, the proportion of HS patients with depression was estimated at 9%; approximately twice that of the general population.[6] Another study showed that up to 21% of individuals with HS may have co-existent depression, according to the Beck Depression Inventory-Short Form (BDI-SF).[7] A post-hoc analysis of the adalimumab Phase II HS trial also confirmed a high rate of depression, with overall 64 of 154 patients (41.6%) reporting co-morbid depression.[8] This was comparable to another study (n=90) which reported 38.6% of HS patients affected by depression, as measured by the Hospital Anxiety and Depression Scale (HADS).[9]

Because of the high psychological burden observed in HS patients the benefit of a reduction in disease activity on the overall psychological status of these patients might not be realised immediately and as such AbbVie agrees with the conclusion of the ACD that *"Improvements in the psychological burden of hidradenitis suppurativa may not be captured in the QALY calculations, because there is a time lag between reducing disease activity and seeing a benefit on patient-reported outcomes".*

HS is also associated with a number of inflammatory diseases, including inflammatory bowel disease, spondyloarthropathies and pyoderma gangrenosum. Squamous cell carcinoma rates are also higher in patients with HS than the general population.[10] Patients with HS also have an increased risk of metabolic syndrome and suicide compared with the general population.[4,11,12] The clinical experts consulted during the appraisal committee meeting also *"noted that hidradenitis suppurativa is associated with increased mortality, which can be a result of physical complications such as sepsis, or people taking their own lives".*

Since the additional improvements in the psychological burden of hidradenitis suppurativa may not have been captured in the QALY calculations and due to the potential impact on mortality (from HS directly ie., suicide or complications due to HS surgery) not being considered in the economic analysis, AbbVie believes that the ICERs upon which the recommendations have been based are likely to be overestimates.

**2. Are the summaries of clinical and cost effectiveness reasonable interpretations of the evidence?**

The ACD does not reasonably interpret some elements of cost-effectiveness associated with adalimumab.

### *2.1 The ERG underestimates the cost of surgical-inpatient admissions*

The European guidelines published in 2015 recommend medical treatment either as monotherapy or in combination with radical surgery for widely spread lesions and surgery/laser for locally recurring lesions. Laser treatment is a potential treatment option early in the course of the disease. Surgery to remove unresponsive lesions is an option, local excision early in the disease and wide surgical excision later in the treatment pathway.[13] Wide surgical excision is generally used in patients with more advanced disease; the skin areas affected by HS are removed in extensive skin surgery and the wounds are left to secondary healing, which can take up to 3 months. Although surgery may offer benefits in terms of patient satisfaction[14] and HRQoL improvements,[15] it increases the risk of infection, excessive bleeding, pain, prolonged healing and further scarring. In addition, surgery is associated with a high rate of recurrence and as it only treats the disease locally, it does not prevent the reappearance of lesions in other locations which means that patients may require multiple surgeries over time. [15,16]

An observational cross-sectional study funded by AbbVie retrospectively reviewed patient notes for 101 patients from 10 UK hospitals for the 5 years prior to July 2014-April 2015.[17] Of those patients, 41% had surgery (86 surgeries over 5 years). Of the 86 surgeries 13.9% (n=12) had surgical complications, and 34.1% (n=14) had recurrent surgery most of which was at the same site (78.6%, n=11). The median time to next surgery was 5 months and the median time to recurrence of disease was 10.2 months (range 0.2 -66 months).

Market research including 315 patients with HS revealed that 79% of patients required surgical intervention as part of their disease management. Although local incision and drainage was the most common procedure, 38% of patients also reported having wide excisions. The common reasons cited by patients for wide excisional surgery was to reduce pain, to clear HS symptoms, and to reduce the impact of HS on their daily life.[18]

The clinical experts consulted during this submission *"noted that people with hidradenitis suppurativa will have repeated and extensive surgeries over their lifetime, which is burdensome"*. The clinical experts also suggested that "*the ERG's alternative assumptions about surgical procedures may have underestimated the costs, but could not present any alternative estimates".*

The ERG estimated a total cost of surgery of £1,525.74. This estimate assumed that 67% of all HS surgeries were intermediate procedures which were undertaken in a day case setting and that of the remaining HS surgeries, patients were assumed to have an average of 2 wide excisions over their lifetime (6%) with all the other remaining surgeries (27%) comprised of an equal mix of elective and non-elective intermediate skin procedures with an average length of stay (LOS) of 2 days.[19]

AbbVie believes that the assumptions used by the ERG to estimate the cost of surgical-inpatient admissions are an underestimate due to the following reasons:

1) The ERG assumed that 67% of all HS surgeries were intermediate procedures which were undertaken as a day case, however the value extracted by the ERG from the HES study "Secondary care management of hidradenitis suppurativa in England: A description of national patient pathways and resource use using hospital episode statistics data from 2007-2013" refers only to the patients who had a first recorded inpatient HS diagnosis code (index spell) during the study period. Instead the total number of inpatient spells reported during the study period was [redacted], of which [redacted] were elective admissions, [redacted] were non-elective and 31,875 were day cases (which indicates that the value used by the ERG in their calculations overestimates the proportion of day cases and as a result underestimates the total cost of surgical-inpatient admissions). [20]

2) Based on clinical expert opinion and market research data conducted by AbbVie it is unlikely that moderate to severe HS patients would only have on average 2 wide surgical excisions over their lifetime.

As such AbbVie believes that the alternative assumption about the cost of surgical-inpatient admissions used in the ERG's base case represent an underestimate of the cost of surgery for HS and as such including this in the cost effectiveness model overestimates the ICER.

### *2.2 Cost effectiveness results based on PIONEER II only*

The base case analysis used data from both Phase III pivotal trials (PIONEER I and II), however utility data was only available from one study (the PIONEER II clinical trial collected EQ-5D information as a measurement of HRQoL, while the PIONEER I trial did not collect EQ-5D data). As such AbbVie also presented a scenario analysis where data from only one trial, PIONEER II, was used. This resulted in an ICER which was higher than that presented in the base case analysis. The ACD states that *"the ICER for adalimumab increased to about £36,400 per QALY gained compared with supportive care (based on a deterministic analysis) when the efficacy data from PIONEER I data were excluded. The committee considered that this was counter-intuitive because the benefit with adalimumab was smaller in PIONEER I than in PIONEER II. This supported the committee's concerns about the company's inconsistent use of data sources instead of a meta-analysis, which contributed to the structural uncertainties in the model".*

The treatment effect observed in PIONEER I was smaller than that observed in PIONEER II. However the reason for the increase in the ICER can't be attributed to the inconsistent use of data sources instead of a meta-analysis as suggested by the Committee. The main reason for the difference in results is due to the fact that the proportion of patients responding to treatment with adalimumab is higher in PIONEER II compared to PIONEER I and, as a result, more patients continue treatment with adalimumab in the cost effectiveness model after week 12 (thus increasing the overall cost of treatment which increases the ICER).

As such AbbVie does not believe that the cost effectiveness results are counter-intuitive when only results from the PIONEER II are used in the cost effectiveness model.

**3. Are the recommendations sound and a suitable basis for guidance to the NHS?**

**AbbVie Response:**

Due to the points discussed above, AbbVie does not believe that the provisional recommendations are sound or a suitable basis for guidance to the NHS.

AbbVie believes that the Committee preferred base case overestimates the ICER by using a lower cost of surgery and by not taking into account the additional psychological benefit that adalimumab could provide (which are not currently captured in the QALY calculations). Furthermore the current analysis does not capture the potential benefits of adalimumab in improving work productivity which would be expected to be significant for HS patient considering that they are usually diagnosed in their early 20s.

There is a clear unmet need for an effective licensed HS treatment in the UK for patients with moderate to severe HS. Adalimumab is the only licensed treatment for moderate to severe HS and represents a step change in the management of HS compared to current standard of care. Results from the pivotal Phase III trials (PIONEER I and II) have demonstrated that adalimumab significantly reduces the number of inflammatory lesions in HS patients, thereby reducing pain and improving overall HRQoL of patients with moderate to severe HS. Adalimumab has the potential to delay and prevent HS from developing to a stage where extensive skin surgery will be required or surgery might not be possible due to skin damage.

**4. Are there any aspects of the recommendations that need particular consideration to ensure we avoid unlawful discrimination against any group of people on the grounds of race, gender, disability, religion or belief, sexual orientation, age, gender reassignment, pregnancy and maternity?**

**AbbVie Response:**

No aspects of the recommendations need particular consideration under these grounds.

## APPENDIX 1

## Factual inaccuracies identified in the ACD

| Section of ACD | Description of inaccuracy | Suggested amendment |
|---|---|---|
| Page 15<br><br>Section 3.18 | *"The ICER for adalimumab was greater than £20,000 per QALY gained, compared with supportive care, in the following scenarios:*<br><br>*time horizon shortened to 20 years or 30 years*<br><br>*data from PIONEER I excluded (model used only PIONEER II)*<br><br>*different imputation rule for missing data"*<br><br>The ICER above 20,000 was based on a different extrapolation method rather than a different imputation rule for missing data. | *"The ICER for adalimumab was greater than £20,000 per QALY gained, compared with supportive care, in the following scenarios:*<br><br>*time horizon shortened to 20 years or 30 years*<br><br>*data from PIONEER I excluded (model used only PIONEER II)*<br><br>*different extrapolation method "* |
| Page 28<br><br>Section 4.13 | *"It noted that the ERG's alternative calculation of transition probabilities beyond week 36 (in which extrapolation was based on data from the PIONEER trials and missing data were handled consistently) did not have a material effect on the ICER".*<br><br>The scenario analysis in which extrapolation is only based on data from the PIONEER trials lowers considerably the ICER (pg. 195 Table 63 of submission of evidence). | *""It noted that the ERG's alternative calculation of transition probabilities beyond week 36 (different imputation rule for missing data) did not have a material effect on the ICER".* |

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**Single Technology Appraisal (STA)**

**Adalimumab for treating moderate to severe hidradenitis suppurativa**

**Comments on the ACD:-**

- While a range of other treatments are used to try to obtain a disease control there is no evidence to suggest a preferred method of treatment, and no other treatment is currently licenced for use for HS patients. This cause's extreme frustration to both healthcare professionals and patients as there is no robust evidence to indicate which would be a preferred method of treatment, meaning a lengthy trial and error process for the patient which in turn increases the stress that HS patient's face which could have a detrimental psychological impact.

- I note that the cost of surgical-inpatient admissions was a key driver for cost effectiveness, but I also wonder whether it would be fair to include the trial and error basis of other treatments (orally and topical) that HS patients are frequently having to undertake. If a patient was able to obtain disease management using Adalimumab then the need for antibiotics, oral immune suppression therapies, and vitamin A derrivatives, such as, Isotetrinoin and even dressings and topical treatments would lessen. These extra costs which are all associated with HS patients would not be as high if disease control was obtained. There are also costs associated with psychological implications due to chronic disease burden that may be able to be alleviated once disease control has been established.

- I note and understand the importance of having appropriate clinical comparators for Adalimumab, however this is a very difficult area to address fully, and also a frustrating one, as every route of treatment differs, and I note that the committee questioned whether infliximab would be an appropriate comparator (Section 4.3). Through my work for the HS Trust, and the connections that I have with patients throughout the UK, I am being informed that infliximab is being withdrawn from patients and patients are being told that this is no longer an option. HS patients will no longer be offered this as a possible treatment, and those currently on this medication will be taken off imminently. HS patients are now left in limbo. Patients literally have nothing to help guide them through this difficult journey and some feel that by going through this trial and error approach with medications does not help, but more so hinder them, with possibly future implications, for instance, building up a resilience to antibiotics etc

- I note that the committee did not consider an added benefit of Adalimumab which may be to reduce the need for surgery as there is no related evidence (Section 4.14), however due to the all-round lack of information surrounding HS and treatments is it fair to reach such

conclusions? Could another scenario also be assumed that by obtaining disease control this may provide an opportunity to have surgery to eradicate troublesome areas, which in the long term may prevent the need for any future surgery and will improve the quality of life and even allow a disabled person to return to work?

- It is clear that there are still many uncertainties that surround HS, particularly surrounding treatment and long term approaches for disease management, but from a patient's perspective, is it viable to NOT recommend adalimumab? By having adalimumab recommended, it may enable an improved quality of life which may include the following benefits to an individual;-
    - Less pain
    - Less wound care
    - Lower need for other medical interventions
    - Improved social life
    - Improved work life
    - Improved personal life
    - Improved relationships
    - Family development opportunities
    - Improved psychological well being
    - Back to employment/work life – enabling better career opportunities
    - Feelings of hopefulness, confidence, self-worth improve
    - Less disease burden
    - More time for other activities due to less time needed for wound care/cleaning/dressing/preparing
    - Lower disease burden on carers/family/friends
    - Less need for primary care interventions nursing/wound clinics/pain clinics/community nursing etc

- I also wonder whether the long term role of adalimumab has been taken into consideration. Some HS patients may enter a natural remission state, or symptoms may calm post menopause for some women, and therefore opportunities may arise where patients can end adalimumab treatment or it may be administered less frequently, if disease control or remission has been established. Therefore the need for continued use is not essential.

- Having a medicine licenced for use with HS, but then not recommended to be used will be soul destroying to patients. Like all medications it may not be for everyone, but to just have an option is life changing. This is a pinnacle moment for HS patients, carers, family and friends as this disease affects a much wider number of people.

**Adalimumab for treating moderate to severe hidradenitis suppurativa [ID812]**

**Comments on Appraisal Consultation Document, March 2016**

**John Ingram, on behalf of the British Association of Dermatologists**

**Has all of the relevant evidence been taken into account?**

We note that RCT data regarding adalimumab 40mg weekly therapy compared to placebo is also available from the phase II trial (Kimball et al 2012). Could any of this data be added to the results of PIONEER I and II for the purposes of modelling, or is this prevented by lack of HiSCR outcome data?

There is some confusion about the source of evidence for current hidradenitis suppurativa (HS) clinical practice in the UK. Two surveys have been conducted but in some places are not differentiated:

1) Ingram JR, McPhee M. Management of hidradenitis suppurativa: a UK survey of current practice. Br J Dermatol 2015; 173: 1070-2.
2) Abbvie-sponsored survey of management of moderate to severe HS, the full results of which have not yet been published in a peer reviewed journal.

The survey by Ingram and McPhee sets out the order of most frequently used medical therapies for HS (however note that while isotretinoin is included, evidence suggests that this is ineffective for most HS patients). The survey sponsored by Abbvie was used by the company to estimate the number of surgical procedures required in a HS patient's lifetime.

**Are the summaries of clinical and cost effectiveness reasonable interpretations of the evidence?**

Yes, the summaries are comprehensive and reasonable. The report includes the issue of uncertainties surrounding surgery for HS, which remains difficult to estimate accurately. In particular, it may be that three or four wide excisions are required on average during the lifetime of a patient with moderate to severe HS, rather than the estimate of two wide excisions included in the ERG report.

In terms of further clarification of the surgery and wound care issues, reduction in suppuration in those patients who respond to adalimumab should decrease wound dressings costs, which can be a substantial component of the costs of supportive care. In addition there should be a reduction in the number of smaller procedures, such as incision and drainage and narrow margin excisions. It is uncertain whether there would be any change to the number of wide excisions because we do not have enough experience of how adalimumab will be used in practice, with the potential to use both adalimumab and wide excision surgery in some patients.

**Are the recommendations sound and a suitable basis for guidance to the NHS?**

Regarding stopping rules, we agree that it is reasonable to continue adalimumab treatment for partial response, defined as a 25-50% reduction in inflammatory lesions, with no increase in abscesses or draining fistulas. We also agree that it is inappropriate to continue treatment for a

further 12 weeks in non-responders, defined as a reduction of less than 25% in the number of inflammatory lesions. It is counterintuitive that, in the pharmacoeconomic model, removal of the rule to continue adalimumab therapy for 12 weeks in non-responders made adalimumab less cost effective.

The BAD wishes to stress that moderate to severe HS represents a large unmet patient need in the NHS, particularly when surgery is impractical due to involvement of several different skin regions. At the moment, clinicians are required to submit individual funding requests for anti-tumour necrosis factor alpha (anti-TNFα) therapies to treat HS, which generates inequalities in HS care provision across the UK. Anti-TNFα therapy represents a step change in HS care and adalimumab is currently the only licenced intervention available for HS.

**Are there any aspects of the recommendations that need particular consideration to ensure we avoid unlawful discrimination against any group of people on the grounds of race, gender, disability, religion or belief, sexual orientation, age, gender reassignment, pregnancy and maternity?**

No.

**Single Technology Appraisal (STA)**

**Adalimumab for treating moderate to severe hidradenitis suppurativa [ID812]**

**Appraisal consultation document**

Patient Expert - Ceri Harris

Comments on document.

I have attempted to read though all the documentation, it is a weighty document and contains a lot of clinical and statistical jargon which is not my forte, even so the main areas of interest for me is the current recommendation that it will not be recommended.

As someone who lives with this condition I am deeply concerned that without the approval, many people with HS will simply be left with no treatment, living very painful, isolating lives and not be able to partake in activities that the rest of the population take for granted.

The reality for someone with HS is access to any support or treatment is a postcode lottery dependant on the clinical awareness of HS of the GP/Consultant/Doctor they come into contact with.

I currently run the Cardiff HS support group and what quickly becomes apparent sadly is the 'brushing off' people with HS experience when trying to get a referral from their GP to a specialist. Often been told, sorry you have HS there is nothing we can do, here is some Hipiscrub. This is our reality. Those that are fortunate to have a good GP, there is a long slow process of referral and then you feel like you have to go through a cycle of trying every medication known to man to try and get some relief. So that's drugs for acne, leprosy and organ rejection, nothing that is identified for HS specifically. This lack of value to our plight and condition can be very distressing.

So when we were told last July that Adalimumab was licensed for HS, it was like a ray of sunlight. It meant that those who were stage 2 and 3 could go to their GP and name a medication that could help. They would still have to go through hoops but it validates their condition and the pain and suffering they have experienced.

I realize my concerns raised here are simply emotional, and what you need are hard facts, statistics and clinical outcomes. Which I feel Abbvie did not provide at the outset, which I personally feel very frustrated about as let down. But my plea and those of many suffering with HS is please, give us a chance, give us a choice and give us hope.

I am currently on Infliximab, and have been for 6 months, it has made such a difference to me and my condition, with large portions of time pain free. But if the treatment starts to impact on my health and no longer work or I have a reaction and need to stop, this means I have run out of options. All I will have is surgery and cudely have lumps cut out of me. As a result I will need time off work, potentially lose my job and be reliant on benefit. I am a single parent who fought to educate myself, putting myself through university as a mature student to better the life of my child and our future. This would be a huge step backwards for me and soul destroying.

This may seem dramatic to you, but this is my life and the lives of 1-100 people living with HS. You have the power to give them hope and treatment, please think very hard before you make the decision to not recommend this treatment.

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | Patient |
| **Job title** | Homemaker |
| **Location** | England |
| **Conflict** | No |
| **Disclosure** | |
| **Comments** | 1297<br><br>I've suffered HS for 17 years now and my quality of life well basically I don't have a life I am in pain every single day I miss doing things with my children because I have numerous open wounds over my body I live with the embarrassment of this every day of my life where I leak through my clothes on my bed,sofas etc if there is a slight glimmer of hope that something could help someone in my position possible have a little bit of a better quality of life I'm disappointed it's being considered to be stopped we need some kind of hope this diesease will get better one day. |
| **Submission date** | 02/03/2016 |

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | Patient |
| **Job title** | Home Shopping Section Leader |
| **Location** | England |
| **Conflict** | No |
| **Disclosure** | |
| **Comments** | 1298<br><br>HS patients are often isolated and neglected due to the lack of medical support. There needs to be an appropriate patient pathway where we are considered as patients still. Hs effects me personally in a lot of way from work like to home life with my partner and son. I feel it stops me doing daily jobs some times and with my job role also stops me from being able to do this without horrific pain! Please support this! |
| **Submission date** | 02/03/2016 |

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | Project Manager |
| **Job title** | Patient |
| **Location** | |
| **Conflict** | No |
| **Disclosure** | |

| | |
|---|---|
| **Comments** | 1299<br><br>Absolutely ridiculous! You are limiting what very few options we have and making it near on impossible to obtain funding - this has worked for patients over years which can be obtained from personal accounts. This decision needs to be reversed. |
| **Submission date** | 02/03/2016 |

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | NHS Professional |
| **Job title** | Consultant Dermatology |
| **Location** | England |
| **Conflict** | No |
| **Disclosure** | I am organising a meeting on HS in march and abbvie are helping to sponsor this meeting to the tune of Â£250. They have no input to the programme. |
| **Comments** | 1312<br><br>Overall the decision not to approve would be very dissappointing. The authors do not seem to understand how devastating this condition really is. Furthermore in patients with severe HS there is no real indication in the review that currently there are no available treatments which work. The TNF inhibitors are the first drugs which have some impact on patients severely affected as most dermatologists who treat these patients will have seen. This drug should be made available to clinicians without the requirement for lengthy form-filling which completely stagnates the running of NHS work, and severely disadvantages patients. |
| **Submission date** | 09/03/2016 |

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | Patient |
| **Job title** | Civil Servant |
| **Location** | Northern Ireland |
| **Conflict** | No |
| **Disclosure** | |
| **Comments** | 1319<br><br>After it has been recognised that Hhmira can benefit those with the debilitating disease hidradenitis suppurativa it is sad that you are considering removing this again, if it can give relief and has already to sufferers I would appreciate you reviewing this decision, I have this disease and am at stage two, so far no drugs have worked for me and this may be an option for the future, and I am gutted to think it may not be available. |

| | |
|---|---|
| **Submission date** | 10/03/2016 |

| | |
|---|---|
| **Name** | [redacted] |
| **Organisation** | |
| **Role** | Patient |
| **Job title** | Music Lecturer (sick) |
| **Location** | England |
| **Conflict** | No |
| **Disclosure** | |
| **Comments** | 1320<br><br>I was diagnosed with Hidradenitis Suppurativa in 1999 in my final year at university. I put my symptoms down to stress but I required surgery later that year and it was then I was informed I was suffering with HS and that I would need further surgeries in future. Currently I am near 50 surgeries, incuding flap grafts and split thickness grafts along with numerous excisions. I have been prescribed various drugs incuding, dapsone, rifampicin, isotretinoin and various antibiotics all without success. I was approved by NICE for Adaimumab and commenced treatment with noticeable reduction of flare ups. However, I needed to stop treatment for surgery and recently saw my dermatologist to discuss restarting the treatment. I was told of this meeting and its relevance to my recommencement of Adalimumab and I felt it necessary to include my input as a point of reference to your discussion on the future of treating hidradenitis Suppurativa. Please consider my only treatment at present of severe disease is inpatient surgery and base the cost against that of Adaimumab and its evidence based success from trials and patient reports. I am willing to discuss my situation further for clarification and to assist your need for information. |
| **Submission date** | 10/03/2016 |

**National Institute for Health and Care Excellence**

**Single Technology Appraisal**

# Adalimumab for treating moderate to severe hidradenitis suppurativa [ID812]

## AbbVie's Response to the request for further analyses in the Appraisal Consultation Document

**11 March 2016**

**Additional evidence requested by the Appraisal Committee in section 1 of the ACD**

*"The committee recommends that NICE requests further analyses from the company, as described in 1.3–1.6. This information should be made available for the second appraisal committee meeting.*

*The information should include a formal meta-analysis of the PIONEER I and II trials. Either meta-analyses of individual patient data or, if this is not feasible, full justification and a formal meta-analysis based on aggregate data. The analysis should include:*

- *the primary and secondary outcomes common to the trials*
- *outcomes used in the cost-effectiveness analysis*
- *subgroup analyses based on the resulting pooled data."*

**AbbVie Response:**

**Meta-analysis of the primary and secondary outcomes from the PIONEER I and II trials**

A meta-analysis of the PIONEER I and II trials was conducted using both individual level patient data and aggregate data. The meta-analysis of the individual patient data (IPD) was based on a one-stage-logistic-model using the maximum likelihood by Laplace approximation method in R software as described by Simmonds et al 2014[1]. The aggregate data meta-analysis used a binomial likelihood logit link model in WinBUGS (as described in example 1a & 1b of the NICE DSU TSD2) for binary response and a normal likelihood identity link model in WinBUGS (as described in example 5a & 5b of the NICE DSU TSD2) for continuous outcomes[2].

The primary efficacy endpoint for Period A in the PIONEER I and II trials was the proportion of subjects achieving Hidradenitis Suppurativa Clinical Response (HiSCR) at Week 12. Since the randomization for study M11-313 was stratified by baseline Hurley Stage (II vs. III), and the randomization for study M11-810 was stratified by baseline Hurley Stage (II vs. III) and baseline concomitant use of antibiotics (Yes vs. No) the meta-analysis of the primary efficacy variable was carried out in the Intent-to-Treat population using the following 6 strata:

| Strata | Study | Hurley Stage | Concomitant Antibiotics Use |
|---|---|---|---|
| 1 | M11-313 | II | No |
| 2 | M11-313 | III | No |
| 3 | M11-810 | II | Yes |
| 4 | M11-810 | II | No |
| 5 | M11-810 | III | Yes |
| 6 | M11-810 | III | No |

The ranked secondary efficacy endpoints for Period A were analysed using the same method as used for the primary endpoint with one exception. The proportion of subjects

[1] Simmonds MC(1), Higgins JP(2). A general framework for the use of logistic regression models in meta-analysis. Stat Methods Med Res. 2014 May 12. pii: 0962280214534409.

[2] http://www.nicedsu.org.uk/TSD2%20General%20meta%20analysis%20corrected%2015April2014.pdf

achieving AN count of 0, 1 or 2 among patients with baseline Hurley Stage II was analysed without the Hurley Stage III stratum; the analysis within Hurley Stage II was pre-specified, and thus only one Hurley Stage was involved.

Table 1 and 2 present the results of the meta-analysis of the primary outcomes of the PIONEER I and II trials using both the IPD and aggregate data approach.

**Table 1: HiSCR response (NRI) at week 12 (ITT population) from models based on individual patient data (IPD) by R**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Estimate | 95% CI | P value | Estimate | 95% CI | P value |
| Log Odds Ratio | 1.061 | (0.726,1.402) | <0.0001 | 1.061 | (0.726,1.402) | <0.0001 |
| Odds Ratio | 2.888 | (2.066,4.062) | | 2.888 | (2.066,4.062) | |
| Variance(random effect) | | | | 0 | | |
| BIC | 836.039 | | | 842.489 | | |

**Table 2: HiSCR response (NRI) at week 12 (ITT population) from Bayesian models based on aggregate data by WinBUGS**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.074 | (0.735,1.419) | 0.174 | 1.174 | (0.566,1.939) | 0.351 |
| Odds Ratio | 2.927 | (2.085,4.133) | | 3.235 | (1.761,6.952) | |
| SD(random effect) | | | | 0.516 | (0.023,1.676) | 0.454 |
| DIC | 69.120 | | | 69.875 | | |

The results of the random effect model based on individual patient data (IPD) by R (Table 1) produced a variance of 0. This could be attributed to a limitation of the maximum likelihood by Laplace approximation method in generating accurate estimates for between-trial variation when the number of trials is very small (2 trials in this case). As such for the secondary endpoints and for the subgroup analyses only the meta-analysis based on aggregate data in WinBUGS are presented as they might provide a more reliable estimate for the random effect model.

Tables 3-5 present the results of the meta-analysis of the ranked secondary outcomes of the PIONEER I and II trials based on aggregate data.

**Table 3: AN response (achieved AN count of 0,1,2, NRI) at week 12 among patients with Hurley state II at baseline from Bayesian models based on aggregate data by WinBUGS**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 0.457 | (0.002,0.916) | 0.234 | 0.482 | (-1.541,2.573) | 0.955 |
| Odds Ratio | 1.579 | (1.002,2.499) | | 1.619 | (0.214,13.105) | |
| SD | | | | 1.174 | (0.048,4.170) | 1.062 |
| DIC | 35.497 | | | 35.643 | | |

**Table 4: NRS30 response (achieved at least 30% reduction and at least 1 unit reduction from baseline in Patient's Global Assessment of Skin Pain at worst, NRI) at**

**week 12 among patients with baseline NRS>=3 from Bayesian models based on aggregate data by WinBUGS**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 0.700 | (0.274,1.129) | 0.219 | 0.763 | (-0.191,1.773) | 0.487 |
| Odds Ratio | 2.014 | (1.315,3.093) | | 2.145 | (0.826,5.888) | |
| SD | | | | 0.826 | (0.067, 2.327) | 0.582 |
| DIC | 66.717 | | | 65.235 | | |

**Table 5: Change in MSS from baseline to week 12 (LOCF) for ITT population, from Bayesian models based on aggregate data by WinBUGS**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| difference between treatment arms | -14.950 | (-21.920,-8.028) | 3.552 | -15.160 | (-22.47,-7.574) | 3.789 |
| SD | | | | 2.355 | (0.127,4.840) | 1.419 |
| DIC | 83.866 | | | 84.344 | | |

Although not a ranked secondary endpoint results for the DLQI are also provided in Table 6.

**Table 6: Change in DLQI from baseline to week 12 (LOCF) for ITT population, from Bayesian models based on aggregate data by WinBUGS**

| | Fixed effect model | | | Random effect model | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| difference between treatment arms | -2.502 | (-3.520,-1.492) | 0.517 | -2.559 | (-4.246,--0.960) | 0.821 |
| SD | | | | 0.937 | (0.015,3.663) | 0.937 |
| DIC | 40.118 | | | 41.039 | | |

**Meta-analysis of outcomes used in the cost-effectiveness analysis**

**Introduction**

The transition probabilities (TPs) used in the economic model for the induction and maintenance period were recalculated using an ordered categorical NMA with treatment effects measured on the probit scale. The TPs model the movements of patients over time across 4 categories of response (high response, response, partial response, non-response). These movements occur at 5 different time points (2, 4, 8, 12 and 36 weeks after baseline).

The previous version of the model included additional transition times between 12 and 36 weeks, however for the NMA, it was necessary to consider the maintenance period (12-36 weeks) as a single transition as the sample size was too small to allow for the TPs for each response category to be estimated properly. Indeed, while 633 patients were followed in the 2 PIONEER studies until 12 weeks, only 350 of them entered the maintenance period. The patients in the adalimumab arm were furthermore split into 2 groups based on whether they discontinued treatment or not. This led to some response states being sparsely populated at some of the initial time points and not allowing the NMA to run satisfactorily.

**Methodology**

The ordered categorical NMA was run using the code shown in example 6 of the DSU TSD2 "A general linear modelling framework for pair-wise and network meta-analysis of randomised controlled trials".

Vague non-informative normal priors with a mean of 0 and a variance of 1000 were given to the study effects (mu) and treatment effects (d). The z.aux node was given a uniform prior between 0 and 5.

The between-study standard deviation in the random-effects model was given a half-normal prior with a mean of 0 and a variance of $0.32^2$ as recommended in DSU TSD3 "Heterogeneity: subgroups, meta-regression, bias and bias-adjustment". A less informative uniform prior was initially tested, however due to the fact the between-study variance needed to be estimated based on only 2 studies, a half-normal distribution proved to be a better modelling choice.

A model was fitted for each starting health state and each transition time.

**Implementation**

The models were fitted to the data via Bayesian Markov chain Monte Carlo (MCMC) methods (Gibbs sampling) and implemented in WinBUGS, version 1.4.3.

They were run using 2 chains with different sets of initial values. For each analysis, an initial 20,000 iterations were run as a burn-in period to achieve convergence and then discarded. Results are based on a further 10,000 iterations (per chain), using a thinning interval of 10.

Convergence towards sensible posterior distributions was assessed visually at the end of each simulation using the history trace plots, the smoothed Kernel posterior density plots. Autocorrelation plots were also checked to ensure the chains were mixing well and the magnitude of the MC error was compared to the standard deviation of the posterior distributions to ensure enough iterations had been saved.

Both fixed-effect and random-effects models were run for each outcome. Their performances were compared using the total residual deviance and the Deviance Information Criterion (DIC). A total of 20,000 CODA samples were retained and utilised directly in the cost-effectiveness model.

The results of the ordered categorical NMA with treatment effects measured on the probit scale are presented in the Statistical Report "Statistical Analyses Output - Base case 11.March.2016".

**Meta-analysis of subgroups from the PIONEER I and II trials**

The results of the meta-analysis of the PIONEER I and II trials for subgroups was conducted using the same method as the one used for the primary endpoint using aggregate data only. The analysis of HiSCR at Week 12 was performed for only those subgroups where the sample size allowed the analysis to be performed. Tables 7-15 present the results of the subgroup analysts using aggregate data from the random effect models.

**Table 7: HiSCR response (NRI) at week 12 (ITT population) by Baseline AN counts**

| | Baseline AN<Median(9) | | | Baseline AN>= Median(9) | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |

| | | | | | | |
|---|---|---|---|---|---|---|
| Log Odds Ratio | 1.089 | (-0.074,2.614) | 0.666 | 1.676 | (0.26,3.348) | 0.759 |
| Odds Ratio | 2.971 | (0.929,13.654) | | 5.344 | (1.297,28.446) | |
| SD | 1.071 | (0.060,3.376) | 0.832 | 1.448 | (0.319,3.630) | 0.823 |
| DIC | 60.766 | | | 63.439 | | |

**Table 8: HiSCR response (NRI) at week 12 (ITT population) by age**

| | Age < 40 | | | Age > = 40 | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.183 | (0.124,2.478) | 0.585 | 1.559 | (0.647,2.752) | 0.538 |
| Odds Ratio | 3.264 | (1.132,11.917) | | 4.754 | (1.910,15.674) | |
| SD | 1.036 | (0.097,2.956) | 0.721 | 0.660 | (0.020,2.634) | 0.687 |
| DIC | 66.724 | | | 54.027 | | |

**Table 9: HiSCR response (NRI) at week 12 (ITT population) by gender**

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.193 | (0.276,2.456) | 0.547 | 1.464 | (0.463,2.705) | 0.569 |
| Odds Ratio | 3.297 | (1.318,11.658) | | 4.323 | (1.589,14.954) | |
| SD | 0.829 | (0.030,2.758) | 0.718 | 0.750 | (0.027,2.781) | 0.718 |
| DIC | 65.209 | | | 55.246 | | |

**Table 10: HiSCR response (NRI) at week 12 (ITT population) by race**

| | white | | | non-white | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.092 | (0.537,1.742) | 0.312 | | | |
| Odds Ratio | 2.980 | (1.711,5.709) | | | | |
| SD | 0.388 | (0.013,1.342) | 0.718 | | | |
| DIC | 65.225 | | | | | |

Note: The model for non-white can't be run because one stratum has 0 sample size for one treatment arm, and sample sizes are too small for other strata.

**Table 11: HiSCR response (NRI) at week 12 (ITT population) by HS duration**

| | HS duration < Median (9.18 years) | | | HS duration >= Median (9.18 years) | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.093 | (-0.065,2.546) | 0.647 | 1.415 | (0.752,2.124) | 0.357 |
| Odds Ratio | 2.983 | (0.937,12.756) | | 4.116 | (2.121,8.365) | |
| SD | 1.130 | (0.087,3.145) | 0.766 | 0.372 | (0.015,1.354) | 0.376 |
| DIC | 63.933 | | | 55.647 | | |

**Table 12: HiSCR response (NRI) at week 12 (ITT population) by weight**

| | Weight < Median (93 kg) | | | Weight >= Median (93 kg) | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.146 | (0.087,2.440) | 0.584 | 1.313 | (0.522,2.241) | 0.357 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Odds Ratio | 3.146 | (1.091,11.473) | | 3.717 | (1.685,9.403) | |
| SD | 0.980 | (0.099,2.794) | 0.684 | 0.602 | (0.026,2.009) | 0.537 |
| DIC | 51.133 | | | 59.905 | | |

**Table 13: HiSCR response (NRI) at week 12 (ITT population) by BMI**

| | BMI < Median (32.06) | | | BMI >= Median (32.06) | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.004 | (0.217,1.917) | 0.429 | 1.500 | (0.423,3.144) | 0.683 |
| Odds Ratio | 2.729 | (1.242,6.801) | | 4.482 | (1.527,23.196) | |
| SD | 0.608 | (0.029,1.954) | 0.517 | 1.021 | (0.037,3.499) | 0.884 |
| DIC | 60.396 | | | 61.287 | | |

**Table 14: HiSCR response (NRI) at week 12 (ITT population) by smoking status**

| | Not current smoker | | | Current smoker | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.542 | (0.564,2.926) | 0.597 | 1.172 | (0.236,2.532) | 0.574 |
| Odds Ratio | 4.674 | (1.758,18.653) | | 3.228 | (1.266,12.579) | |
| SD | 0.803 | (0.021,2.915) | 0.761 | 0.856 | (0.038,2.965) | 0.748 |
| DIC | 56.554 | | | 63.882 | | |

**Table 15: HiSCR response (NRI) at week 12 (ITT population) by prior HS surgery status**

| | Prior HS surgery=No | | | Prior HS surgery=Yes | | |
|---|---|---|---|---|---|---|
| | Mean | 95% CrI | SD | Mean | 95% CrI | SD |
| Log Odds Ratio | 1.226 | (0.523,2.105) | 0.399 | | | |
| Odds Ratio | 3.408 | (1.687,8.207) | | | | |
| SD | 0.627 | (0.033,1.890) | 0.493 | | | |
| DIC | 68.628 | | | | | |

Note: The model for prior HS surgery="Yes" can't be run because one stratum has 0 sample size for one treatment arm, and sample sizes are too small for other strata.

*"A revised base-case deterministic and probabilistic cost-effectiveness analysis of adalimumab compared with supportive care should be provided, incorporating:*

- *the results of a formal meta-analysis of the PIONEER trials*
- *the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later (see section 4.8)."*

**AbbVie Response:**

In order to implement the results of the meta-analysis into the cost effectiveness model some changes to the model structure were required. These changes are described in more detail in Appendix A.

**Revised base case results including proposed PAS**

The cost effectiveness model used to run the revised base case with the results of the meta-analysis was based on the ERG corrected model (ERG Exploratory Analysis 1).

Table 16 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (fixed effect model) and the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later.

**Table 16: Base-case results (fixed effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £128,648 | 22.92 | 11.63 | | | | |
| ADA | £140,349 | 22.92 | 12.58 | | | | |
| ADA vs. SC | - | | | £11,701 | 0.000 | 0.95 | **£12,338** |

Table 17 presents the results of the revised base-case probabilistic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (fixed effect model) and the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later.

**Table 17: Base-case probabilistic results (fixed effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £128,396 | 22.92 | 11.64 | | | | |
| ADA | £141,109 | 22.92 | 12.60 | | | | |
| ADA vs. SC | - | | | £12,712 | 0.00 | 0.96 | **£13,183** |

Table 18 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (random effect model) and the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later.

**Table 18: Base-case results (random effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £128,647 | 22.92 | 11.63 | | | | |
| ADA | £140,342 | 22.92 | 12.58 | | | | |
| ADA vs. SC | - | | | £11,695 | 0.000 | 0.95 | **£12,336** |

Table 19 presents the results of the revised base-case probabilistic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (random effect model) and the committee's preferred

assumption about treatment continuation for people in the non-response health state at 36 weeks or later.

**Table 19: Base-case probabilistic results (random effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £129,062 | 22.92 | 11.64 | | | | |
| ADA | £142,407 | 22.92 | 12.61 | | | | |
| ADA vs. SC | - | | | £13,345 | 0.00 | 0.98 | **£13,676** |

*Three alternative scenario analyses, applied to the revised base case, should also be provided, in which*

- *Partial response is defined as 25% to 50% reduction in the total abscess and inflammatory nodule (AN) count and no increase in abscesses and draining fistulas.*
- *Transition probabilities beyond week 36 are based on the PIONEER trials instead of the open-label extension study, and missing data are handled consistently.*
- *Both assumptions above are combined"*

**AbbVie Response:**

**Scenario 1. Revised base case including new definition of partial responders**

In order to provide a scenario analysis that included a new definition of partial responders (25% to 50% reduction in the total abscess and inflammatory nodule (AN) count and no increase in abscesses and draining fistulas) new transition probabilities (TPs) for the economic model for the induction and maintenance period were recalculated using the ordered categorical NMA with treatment effects measured on the probit scale (using the same methods as the one used for the base case analysis. Please refer to the Statistical Report "Statistical Analyses Output - Scenario analysis 11.March.2016" for the results of the meta-analysis). In addition all the generalised logit models used to extrapolate data beyond week 36 [for ADA (PIONEER I/II and OLE), SC and ADA discontinuers] were re-calculated based on this new definition (Appendix B).

Table 20 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (fixed effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later and using the new definition of partial responders.

**Table 20: Revised base case including new definition of partial responders including proposed PAS (fixed effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £125,241 | 22.92 | 11.86 | | | | |
| ADA | £130,234 | 22.92 | 12.52 | | | | |
| ADA vs. SC | | | | £4,993 | 0.000 | 0.65 | **£7,656** |

Table 21 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (random effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later and using the new definition of partial responders.

**Table 21: Revised base case including new definition of partial responders including proposed PAS (random effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £125,243 | 22.92 | 11.86 | | | | |
| ADA | £130,225 | 22.92 | 12.51 | | | | |
| ADA vs. SC | | | | £4,982 | 0.000 | 0.65 | **£7,646** |

**Scenario 2. Revised base case including transition probabilities beyond week 36 from the PIONEER trials**

For patients on ADA transition probabilities were estimated using a generalised logit model using the week 12-36 data from the PIONEER I and II clinical trials. Patients who received ADA in the induction period, who were week 12 responders, and who continued receiving ADA during week 12-36, were used to estimate the TPs of ADA treatment for the period beyond week 36 in the model. The dependent variable was the current health state, and the independent variables were the previous health state and the ADA dosing regimen (EW or EOW). Both patients receiving ADA EW and patients receiving ADA EOW were included in the generalised logit model, in order to increase the sample size and to maximize the utilised data. ADA EW specific TPs were estimated from the generalised logit model and applied to the cost effectiveness model. Missing values were imputed using the non-responder imputation (NRI) method to be consistent with the primary efficacy analysis imputation method specified in the clinical trial protocols.

Table 22 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (fixed effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later and using transition probabilities beyond week 36 from the PIONEER trials.

**Table 22: Revised base case including transition probabilities beyond week 36 from the PIONEER trial including proposed PAS (fixed effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £128,648 | 22.92 | 11.63 | | | | |
| ADA | £130,250 | 22.92 | 12.39 | | | | |
| ADA vs. SC | - | | | £1,602 | 0.000 | 0.76 | **£2,101** |

Table 23 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (random effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later and using transition probabilities beyond week 36 from the PIONEER trials.

**Table 23: Revised base case including transition probabilities beyond week 36 from the PIONEER trial including proposed PAS (random effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £128,647 | 22.92 | 11.63 | | | | |
| ADA | £130,247 | 22.92 | 12.39 | | | | |
| ADA vs. SC | - | | | £1,599 | 0.000 | 0.76 | **£2,098** |

**Scenario 3. Revised base case including new definition of partial responders and transition probabilities beyond week 36 from the PIONEER trials**

Table 24 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (fixed effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later, the new definition of partial responders and transition probabilities beyond week 36 from the PIONEER trials (with GLMs based on the new definition of partial responders).

**Table 24: Revised base case including transition probabilities beyond week 36 from the PIONEER trials including proposed PAS (fixed effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £125,241 | 22.92 | 11.86 | | | | |
| ADA | £126,380 | 22.92 | 12.43 | | | | |
| ADA vs. SC | - | | | £1,139 | 0.000 | 0.57 | **£2,014** |

Table 25 presents the results of the revised base-case deterministic cost-effectiveness analysis of adalimumab compared with supportive care including the results of the meta-analysis of the PIONEER trials (random effect model), the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later, the new definition of partial responders and transition probabilities beyond week 36 from the PIONEER trials (with GLMs based on the new definition of partial responders).

**Table 25: Revised base case including transition probabilities beyond week 36 from the PIONEER trials including proposed PAS (random effect model)**

| Technology | Total costs (£) | Total LYs | Total QALYs | Incremental costs (£) | Incremental LYs | Incremental QALYs | ICER (£) Incremental (QALYs) |
|---|---|---|---|---|---|---|---|
| SC | £125,243 | 22.92 | 11.86 | | | | |
| ADA | £126,373 | 22.92 | 12.43 | | | | |
| ADA vs. SC | - | | | £1,131 | 0.000 | 0.57 | **£2,002** |

"*The Committee also requires further clarification of the following:*

- *Calculation of utility values (table 47 of the company submission). Include the number of patients used to inform the utility values, the percentage of responses at 12 and 36 weeks, and patient characteristics (Hurley stage, AN count, abscess and*

*draining fistulae count, Modified Sartorius Score and Dermatology Life Quality Index). Provide this information separately for high response, response, partial response and non-response."*

**AbbVie Response:**

Table 26 displays the number of patients used to inform the utility values and their characteristics at week 12 and week 36. In particular, patients in the PIONEER II trial who contributed to the EQ-5D assessment at week 12 and week 36, respectively, were classified into 4 response categories. Summary statistics for the different measures at week 12 and 36 were estimated for each response group. In the trials, responses were not evaluated at baseline, and thus summary were not provided at baseline.

**Table 26: Characteristics of patients contributed to utility measures**

| Variable | High Response (N=105)[1] | Response (N=76)[1] | Partial Response (N=79)[1] | Non-Response (N=105)[1] |
|---|---|---|---|---|
| **Week 12[2]** | | | | |
| Number of patients contributing to EQ-5D at Week 12, (n, %)[3] | 78 (26%) | 59 (19%) | 66 (22%) | 100 (33%) |
| Hurley Stage, (n, %)[4] | | | | |
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| Total AN count, mean (SD) | | | | |
| Abscess count , mean (SD) | | | | |
| Draining fistula count, mean (SD) | | | | |
| Modified sartorius score, mean (SD)[5] | | | | |
| Dermatology life quality index, mean (SD)[6] | | | | |
| **Week 36[2]** | | | | |
| Number of patients contributing to EQ-5D at Week 36, (n, %)[3] | 52 (47%) | 24 (22%) | 28 (25%) | 7 (6%) |
| Hurley Stage, (n, %)[4] | | | | |
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| Total AN count, mean (SD) | | | | |
| Abscess count , mean (SD) | | | | |
| Draining fistula count, mean (SD) | | | | |
| Modified sartorius score, mean (SD)[5] | | | | |
| Dermatology life quality index, mean (SD)[6] | | | | |

**Notes:**

1. N indicated the number of patients who ever contributed to the utilities of high response, response, partial response, or non-response, respectively, at either Week 12 or Week 36.
2. Summary statistics for Week 12 were based on patients who have contributed to EQ-5D at Week 12; summary statistics for Week 36 were based on patients who have contributed to EQ-5D at Week 36; Statistics were evaluated among patients with non-missing values for each variable.

3. The proportion reported is the proportion of patients in each response category among patients who contributed to the EQ-5D data at the evaluation week.
4. Hurley stage 0 indicates complete clearness of the disease.
5. Modified sartorius score ranges from 0 to no maximum value, with higher value indicating worse disease.
6. Dermatology life quality index ranges from 0 to 30, with higher value indicating worse disease.

- *How resource use estimates were generated for each level of Hidradenitis Suppurativa Clinical Response (HiSCR). Provide:*
    - *results for each relevant physician survey question (including number of respondents, mean, range and standard deviation)*
    - *an explanation of how the responses were combined*
    - *an explanation of how the figures in table 51 of the company submission were derived.*

**AbbVie Response:**

Resource use in the model by health state was estimated based on a survey from a relatively large sample of physicians (n=40) who actively treat moderate to severe HS patients in the UK. Physicians were surveyed regarding the frequency of each type of resource use, stratified by health state as used in the economic analysis (i.e., by responder status). Estimates elicited from the experts were aggregated across respondents using descriptive statistics, and the mean of the answers provided were fed into the economic model. Results for each relevant physician survey question are provided in Appendix C (including number of respondents, mean and ranges) together with an explanation of how the responses were combined.

The resource use information in the survey was collected and estimated separately for patients with moderate and severe HS. Table 27 and 28 present the resource use rates by health states for moderate and severe patients respectively. In order to derive the figure presented in Table 51 of the company submission the values by disease severity (moderate and severe) were weighted based on the proportions of patients in each disease severity category, as observed in the PIONEER I and II trials (the proportion of moderate patients in the PIONEER I and II trials was 44.7% = 282/631).

**Table 27: Resource use rates by health states for moderate patients**

| Resource | Average number of units per year | | | |
|---|---|---|---|---|
| | High Response | Response | Partial Response | Non-Response |
| Number of hospitalisations for HS surgeries | 0.14 | 0.17 | 0.29 | 0.82 |
| Outpatient visits due to HS surgery | | | | |
| - Outpatient visits due to HS surgery | 0.20 | 0.33 | 0.46 | 0.83 |
| - Visits to wound-care due to HS surgery (presumed outpatients) | 0.07 | 0.20 | 0.26 | 0.38 |
| Number of hospitalisation non-surgery related | 0.09 | 0.14 | 0.18 | 0.50 |
| Non-surgical outpatient visits | | | | |
| - Routine outpatient visits | 2.97 | 3.54 | 4.13 | 4.63 |
| - Visits to wound-care NOT due to HS surgery (presumed outpatients) | 1.07 | 0.68 | 0.74 | 0.47 |
| Emergency room visits | 0.15 | 0.25 | 0.35 | 0.59 |

**Table 28: Resource use rates by health states for severe patients**

| Resource | Average number of units per year | | | |
|---|---|---|---|---|
| | High Response | Response | Partial Response | Non-Response |
| Number of hospitalisations for HS surgeries | 0.11 | 0.26 | 0.75 | 0.78 |
| Outpatient visits due to HS surgery | | | | |
| - Outpatient visits due to HS surgery | 0.23 | 0.37 | 0.84 | 1.03 |
| - Visits to wound-care due to HS surgery (presumed outpatients) | 0.15 | 0.15 | 0.51 | 1.23 |
| Number of hospitalisation non-surgery related | 0.12 | 0.30 | 0.38 | 0.42 |
| Non-surgical outpatient visits | | | | |
| - Routine outpatient visits | 3.22 | 3.48 | 4.69 | 4.73 |
| - Visits to wound-care NOT due to HS surgery (presumed outpatients) | 0.35 | 0.31 | 0.56 | 0.43 |
| Emergency room visits | 0.08 | 0.16 | 0.57 | 0.56 |

- *How data were selected from the open-label extension study to inform the transition probabilities in the cost-effectiveness analysis. Why were data from only weeks 0, 12 and 24 used? How many observations were used at each time point?*

**AbbVie Response:**

Patients in the open-label extension trial (OLE) who had received ADA treatments during the preceding PIONEER I and II clinical trials were selected for transition probability (TP) estimation. Patients who were week 12 non-responders in the preceding PIONEER I and II clinical trials were excluded to be consistent with the stopping rule in the model. In the OLE trial, data were collected with a 12-week interval. TPs were estimated using the generalised logit model using week 0, week 12, and week 24 data from the OLE trial (week 0 of OLE corresponded to week 36 of the PIONEER I and II clinical trials). Only data up to week 24 of the OLE trial was used since less than half the patients had follow-up longer than 24 weeks at the time of the data cut.

Table 29 presents the number of patients with observed response states at week 0, 12, 36, 48, and 60. At week 24, 48% (i.e., 1-52%) had missing values, and at week 36, 66% of patients had missing values. The missing values were driven by insufficient follow-up (as the trial is still ongoing). Given the high proportion of patients with missing values for week 36 and beyond, imputation for week 36 and onward could be less reliable. Therefore, only 24 weeks of data were used for analysis. In the base-case cost effectiveness model, LOCF imputation approach is used to impute missing values up to week 24, thus the number of observations contributing to the TP estimate is 58 patients at week 0, 12 and 24. In the response to clarifications questions, AbbVie also provided a sensitivity analysis using only observed values to estimate TP; in this sensitivity analysis, only patients with observed values at week 0, 12 and 24 contributed to the analysis.

**Table 29: Number of patients by follow-up time in the OLE trial**

| Number of Patients with Indicated Follow Up Time in the OLE Trial | | | | | | |
|---|---|---|---|---|---|---|
| **Week** | **High Response** | **Response** | **Partial Response** | **Non-response** | **Total** | **Percentage with follow up** |
| Week 0 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| Week 12 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

| | | | | | | |
|---|---|---|---|---|---|---|
| Week 24 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| Week 36 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| Week 48 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| Week 60 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

- *How the model was validated. Present the data in table 58 of the company submission by arm and provide a comparison of the model's quality-adjusted life-year predictions by arm at 12 weeks and 36 weeks with those seen in the clinical trial."*

**AbbVie Response:**

Tables 30 and 31 present the model validation for the adalimumab arm and supportive care arm, respectively. The table for the adalimumab arm is the same as Table 58 in the company's submission report. The distributions for the adalimumab and supportive care arms in the cost effectiveness model (estimated after excluding natural death and reweighted to make the sum of proportions in the four response states equal to 100%) were similar to those observed from the trials.

**Table 30: Validation of health states distributions for the ADA arm (same as Table 58 in the Submission Report)**

| Week | Observed from PIONEER I and PIONEER II | | | | Predicted in the CEA | | | |
|---|---|---|---|---|---|---|---|---|
| | High response (%) | Response (%) | Partial response (%) | Non-response (%) | High response (%) | Response (%) | Partial response (%) | Non-Response (%) |
| 0 | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| 12 | 42.6% | 33.8% | 23.5% | 0.0% | 44.2% | 30.2% | 25.6% | 0.0% |
| 36 | [redacted] | [redacted] | [redacted] | [redacted] | 36.8% | 20.6% | 5.9% | 36.7% |

**Table 31: Validation of health states distributions for the supportive care (SC) arm**

| Week | Observed from PIONEER I and PIONEER II | | | | Predicted in the CEA | | | |
|---|---|---|---|---|---|---|---|---|
| | High response (%) | Response (%) | Partial response (%) | Non-response (%) | High response (%) | Response (%) | Partial response (%) | Non-Response (%) |
| 0 | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| 12 | 13.9% | 12.9% | 22.1% | 51.1% | 13.9% | 12.9% | 22.1% | 51.1% |
| 36* | [redacted] | [redacted] | [redacted] | [redacted] | 10.7% | 4.4% | 7.6% | 77.2% |

*Only the PIONEER II trial contributed to week 36 data for the placebo arm given the PIONEER I do not have patients received PBO in both Period A and B. This is consistent with the model, where transition probabilities for the placebo arm from Week 12-36 were based on the PIONEER II trial only.

Table 32 compares the utility predictions by arm at week 12 and week 36 with those seen in the clinical trials. The utilities predicted in the cost effectiveness model were similar to the ones observed from the PIONEER II trial.

**Table 32: Validation of utility by arms**

| | Observed in the PIONEER II trial | Predicted in the CEA when PIONEER II trial source is selected | Predicted in the CEA when PIONEER I and II trial sources are selected |
|---|---|---|---|
| Utility at Week 12 in ADA arm | 0.700 | 0.714 | 0.710 |
| Utility at Week 36 in ADA arm | 0.661 | 0.625 | 0.643 |
| Utility at Week 12 in SC arm | 0.557 | 0.573 | 0.570 |
| Utility at Week 36 in SC arm | 0.520 | 0.525 | 0.524 |

# Appendix A

### Summary of cost effectiveness model changes

In order to implement the results of the meta-analysis into the cost effectiveness model four additional sheets were added; one for each set of meta-analysis (random and fixed effects for the base case and for the alternative definition of partial response). Each of these sheets have 20,000 coda iterations in them for each of the meta-analysis run (except for the partial response transition probabilities for weeks 12 to 36 in the scenario analysis, for which there are only 10,000 iterations). For the base case ICER the median transition probabilities are used, for the lower and upper bound used in the OWSA the 2.5th and 97.5th percentile are used. In the PSA a random iteration is chosen from the iterations provided. The values calculated in rows 3 to 6 of these meta-analysis sheets feed into the parameters sheet, which has been updated to process these data.

On the Transition Probabilities sheet, the 4-weekly transition probabilities for weeks 12 to 36 show as N/A if any of the meta-analyses are selected on the Base Case Results sheet. Instead, transition probabilities for week 12 to 36 are shown (Q88:V94 for SC, E112:N122 for ADA and E184:J190 for ADA discontinuers).

On the Markov Trace - ADA and Markov Trace – SC sheets cell F15 is either 16 or 36 weeks depending on whether or not one of the meta-analyses is selected. Also, in columns DV and DW on Markov Trace – ADA and column BU of Markov Trace – SC the table of transition probabilities selected is based on whether or not one of the meta-analyses is selected. If one of the meta-analyses is selected, cells BE15:BH15, BJ15, BK15:BN15, BP15:BS15, BU15:BX15, CX15:DA15 on the Markov Trace – ADA sheet and cells Q15:V15, X15:AA15, AC15:AF15, BB15:BE15 on the Markov Trace – SC sheet are multiplied by 6 (this cycle is 24 weeks instead of 4, which is 6 times as long).

The totals on the Markov Trace sheets on rows 874:876 are adapted so that if one of the meta analyses is selected, they count the cycle on row 15 as 24 weeks instead of 4, and they include 5 rows less, as 5 less cycles are used to get to the selected time horizon (for example if a 20 year time horizon is selected, the totals include values from up until 266 rather than row 271).

For the scenario analysis using partial responders new TPs were added in ADA TP sheet G214:J217, AL194:AO197, AL218:AO221 and SC TP sheet AL125:AO128.

# Appendix B

### Modelled TP extrapolation: TPs for ADA patients after Week 36 (PIONEER I & II)

| Week 36+ on SC | | | | | | |
|---|---|---|---|---|---|---|
| From / To | | SC | | | | |
| | | Number of observations | High response | Response | Partial response | Non-response |
| ADA | High response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Partial response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Non-response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

### Modelled TP extrapolation: TPs for ADA discontinuers after Week 36 (PIONEER I & II)

| After Discontinuation Week 36+ | | | | | | |
|---|---|---|---|---|---|---|
| From / To | | SC | | | | |
| | | Number of observations | High response | Response | Partial response | Non-response |
| ADA / SC | High response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Partial response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Non-response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

### Modelled TP extrapolation: TPs for SC patients after Week 36 (PIONEER I & II)

| Week 36+ on SC | | | | | | |
|---|---|---|---|---|---|---|
| From / To | | SC | | | | |
| | | Number of observations | High response | Response | Partial response | Non-response |
| SC | High response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Partial response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Non-response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

### Modelled TP extrapolation: TPs for ADA patients after Week 36 (OLE)*

| Week 36+ on ADA | | | | | | |
|---|---|---|---|---|---|---|
| From / To | | SC | | | | |
| | | Number of observations | High response | Response | Partial response | Non-response |
| ADA | High response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Partial response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| | Non-response | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

*Based on an ordered logistic model

## Appendix C

## Estimation of number of events per patient per year for moderate patients based on data from the online physician questionnaire

| | Moderate | | | |
|---|---|---|---|---|
| | **High response N Mean (min/max)** | **Response N Mean (min/max)** | **Partial response N Mean (min/max)** | **Non-response N Mean (min/max)** |
| Average number of patients (Q12a) ***(c)*** | **N=40 3.68 (0,30)** | **N=40 5.73 (1,20)** | **N=40 4.08 (0,20)** | **N=40 1.95 (0,11)** |
| Average number that had any inpatient procedures (Q13ai) ***(b)*** | **N=40 0.30 (0,2)** | **N=40 0.63 (0,5)** | **N=40 0.83 (0,8)** | **N=40 0.83 (0,9)** |
| Average number that had any outpatient procedures (Q13ai) N=40 | **N=40 0.38 (0,2)** | **N=40 0.80 (0,4)** | **N=40 0.70 (0,2)** | **N=40 0.48 (0,4)** |
| Average number that had any hospitalisation not involving surgery (Q13aii) | **N=40 0.23 (0,4)** | **N=40 0.55 (0,5)** | **N=40 0.58 (0,8)** | **N=40 0.65 (0,8)** |
| Average number that had any H-S related A&E visit (Q13aii) | **N=40 0.30 (0,3)** | **N=40 0.80 (0,4)** | **N=40 1.00 (0,5)** | **N=40 0.53 (0,5)** |
| Average number that had any Surgery related visit to wound-care (Q13aii) | **N=40 0.13 (0,1)** | **N=40 0.50 (0,3)** | **N=40 0.45 (0,2)** | **N=40 0.28 (0,2)** |

| | | | | |
|---|---|---|---|---|
| Average number that had any Non-Surgery related visit to wound-care (Q13aii) | **N=40<br>1.38<br>(0,30)** | **N=40<br>1.38<br>(0,15)** | **N=40<br>1.58<br>(0, 15)** | **N=40<br>0.95<br>(0,6)** |
| | | | | |
| Proportion that had any inpatient procedures ***(A)*** | 8.2% | 10.9% | 20.2% | 42.3% |
| Proportion that had any outpatient procedures | 10.2% | 14.0% | 17.2% | 24.4% |
| Proportion that had any hospitalisation not involving surgery | 6.1% | 9.6% | 14.1% | 33.3% |
| Proportion that had any H-S related A&E visit | 8.2% | 14.0% | 24.5% | 26.9% |
| Proportion that had any Surgery related visit to wound-care | 3.4% | 8.7% | 11.0% | 14.1% |
| Proportion that had any Non-Surgery related visit to wound-care | 37.4% | 27.5% | 23.3% | 16.7% |
| | | | | |
| Average number of hospitalisations for those that underwent at least one in-patient HS surgical procedure (Q13b) **(B)** | **N=8<br>1.75<br>(1,6)** | **N=14<br>1.57<br>(1,5)** | **N=18<br>1.44<br>(1,6)** | **N=16<br>1.94<br>(1,8)** |
| Average out-patient visits involving HS surgical procedure for those that had at least one out-patient HS surgical procedure (Q13c) | **N=12<br>1.92<br>(1,4)** | **N=20<br>2.35<br>(1,6)** | **N=22<br>2.68<br>(1,8)** | **N=12<br>3.42<br>(1,9)** |
| Average number of hospitalisations for those that had at least one hospitalisation not involving HS surgical procedure (Q13d) | **N=6<br>1.50<br>(1,4)** | **N=12<br>1.50<br>(1,4)** | **N=11<br>1.27<br>(1,3)** | **N=10<br>1.50<br>(1,3)** |
| Average number of A&E visits for those that had at least one non-surgical A&E visit (Q13e) | **N=8<br>1.88<br>(1,5)** | **N=17<br>1.76<br>(1,9)** | **N=24<br>1.42<br>(1,3)** | **N=11<br>2.18<br>(1,4)** |
| Average number of wound care visits following surgery for those that had at least one visit to wound care (Q13f) | **N=5<br>2.20<br>(1,5)** | **N=14<br>2.29<br>(1,4)** | **N=16<br>2.38<br>(1,12)** | **N=9<br>2.67<br>(1,5)** |
| Average number of wound care visits non-surgery related for those that had at least one non-surgery related wound care visit (Q13g) | **N=15<br>2.87<br>(1,7)** | **N=22<br>2.45<br>(1,7)** | **N=17<br>3.18<br>(1,10)** | **N=11<br>2.82<br>(1,5)** |
| Average number of routine outpatient visits (Q13h) | **N=29<br>2.97<br>(1,4)** | **N=39<br>3.54<br>(1,8)** | **N=38<br>4.13<br>(1,12)** | **N=24<br>4.63<br>(2,12)** |
| **Per patient per year** | | | | |
| Number of hospitalisations for HS surgeries **(C)** | | | | |
| Number of outpatient visits due to HS surgery | 0.14 | 0.17 | 0.29 | 0.82 |

| | | | | |
|---|---|---|---|---|
| Number of non-surgical hospitalisations | 0.20 | 0.33 | 0.46 | 0.83 |
| Number of A&E visits | 0.09 | 0.14 | 0.18 | 0.50 |
| Number of surgery-related wound-care visits | 0.15 | 0.25 | 0.35 | 0.59 |
| Number of non-surgery-related wound-care visits | 0.07 | 0.20 | 0.26 | 0.38 |
| Number of routine outpatient visits | 1.07 | 0.68 | 0.74 | 0.47 |

Q= question from online survey
N= number of respondents
Min/Max=minimum/maximum

The number of events per patient per year (C) (as used in the cost-effectiveness model) were estimated by multiplying the estimated proportion of patients who had an event (A) by the average number of events estimated by the online physician questionnaire (B). This was done for all resource use items i.e., outpatient visits, non-surgical hospitalisations, A&E visits, surgery-related wound-care visits etc. (the estimated proportion of patients who had an event (A) was estimated by dividing the average number that had any event as reported in the questionnaire (Q13ai) (a) by the average number of patients seen by the physicians (Q12a) (c)).

## Estimation of number of events per patient per year for severe patients based on data from the online physician questionnaire

| | **Severe** | | | |
|---|---|---|---|---|
| | **High response**<br>**N**<br>**Mean**<br>**(min/max)** | **Response**<br>**N**<br>**Mean**<br>**(min/max)** | **Partial response**<br>**N**<br>**Mean**<br>**(min/max)** | **Non-response**<br>**N**<br>**Mean**<br>**(min/max)** |
| Average number of patients (Q12a) | **N=40**<br>**2.95**<br>**(0,20)** | **N=40**<br>**3.88**<br>**(0,30)** | **N=40**<br>**3.08**<br>**(0,20)** | **N=40**<br>**1.78**<br>**(0,13)** |
| Average number that had any inpatient procedures (Q13ai) | **N=40**<br>**0.25**<br>**(0,3)** | **N=40**<br>**0.68**<br>**(0,5)** | **N=40**<br>**1.00**<br>**(0,8)** | **N=40**<br>**0.80**<br>**(0,9)** |
| Average number that had any outpatient procedures (Q13ai) | **N=40** | **N=40** | **N=40** | **N=40** |

| | | | | |
|---|---|---|---|---|
| | **0.33**<br>**(0,3)** | **0.55**<br>**(0,2)** | **0.88**<br>**(0,5)** | **0.63**<br>**(0,5)** |
| Average number that had any hospitalisation not involving surgery (Q13aii) | **N=40**<br>**0.20**<br>**(0,1)** | **N=40**<br>**0.83**<br>**(0,15)** | **N=40**<br>**0.75**<br>**(0,7)** | **N=40**<br>**0.48**<br>**(0,8)** |
| Average number that had any H-S related A&E visit (Q13aii) | **N=40**<br>**0.20**<br>**(0,1)** | **N=40**<br>**0.45**<br>**(0,3)** | **N=40**<br>**0.78**<br>**(0,5)** | **N=40**<br>**0.50**<br>**(0,5)** |
| Average number that had any Surgery related visit to wound-care (Q13aii) | **N=40**<br>**0.20**<br>**(0,2)** | **N=40**<br>**0.23**<br>**(0,1)** | **N=40**<br>**0.55**<br>**(0,4)** | **N=40**<br>**0.63**<br>**(0,6)** |
| Average number that had any Non-Surgery related visit to wound-care (Q13aii) | **N=40**<br>**0.38**<br>**(0,3)** | **N=40**<br>**0.53**<br>**(0,9)** | **N=40**<br>**0.55**<br>**(0,4)** | **N=40**<br>**0.30**<br>**(0,2)** |
| | | | | |
| Proportion that had any inpatient procedures | 8.5% | 17.4% | 32.5% | 45.1% |
| Proportion that had any outpatient procedures | 11.0% | 14.2% | 28.5% | 35.2% |
| Proportion that had any hospitalisation not involving surgery | 6.8% | 21.3% | 24.4% | 26.8% |
| Proportion that had any H-S related A&E visit | 6.8% | 11.6% | 25.2% | 28.2% |
| Proportion that had any Surgery related visit to wound-care | 6.8% | 5.8% | 17.9% | 35.2% |
| Proportion that had any Non-Surgery related visit to wound-care | 12.7% | 13.5% | 17.9% | 16.9% |
| | | | | |
| Average number of hospitalisations for those that underwent at least one in-patient HS surgical procedure (Q13b) | **N=6**<br>**1.33**<br>**(1,2)** | **N=14**<br>**1.50**<br>**(1,3)** | **N=20**<br>**2.30**<br>**(1,12)** | **N=15**<br>**1.73**<br>**(1,5)** |
| Average out-patient visits involving HS surgical procedure for those that had at least one out-patient HS surgical procedure (Q13c) | **N=10**<br>**2.10**<br>**(1,5)** | **N=17**<br>**2.59**<br>**(1,5)** | **N=22**<br>**2.95**<br>**(1,7)** | **N=13**<br>**2.92**<br>**(1,8)** |
| Average number of hospitalisations for those that had at least one hospitalisation not involving HS surgical procedure (Q13d) | **N=5**<br>**1.80**<br>**(1,4)** | **N=10**<br>**1.40**<br>**(1,2)** | **N=14**<br>**1.57**<br>**(1,3)** | **N=9**<br>**1.56**<br>**(1,4)** |
| Average number of A&E visits for those that had at least one non-surgical A&E visit (Q13e) | **N=8**<br>**1.25** | **N=14**<br>**1.36** | **N=19**<br>**2.26** | **N=12**<br>**2.00** |

| | | | | |
|---|---|---|---|---|
| | **(0,2)** | **(1,3)** | **(1,9)** | **(1,5)** |
| Average number of wound care visits following surgery for those that had at least one visit to wound care (Q13f) | **N=7<br>2.29<br>(1,5)** | **N=9<br>2.56<br>(1,5)** | **N=14<br>2.86<br>(1,4)** | **N=14<br>3.50<br>(1,6)** |
| Average number of wound care visits non-surgery related for those that had at least one non-surgery related wound care visit (Q13g) | **N=9<br>2.78<br>(1,7)** | **N=11<br>2.27<br>(1,7)** | **N=15<br>3.13<br>(1,10)** | **N=11<br>2.55<br>(1,5)** |
| Average number of routine outpatient visits (Q13h) | **N=23<br>3.22<br>(1,6)** | **N=29<br>3.48<br>(1,7)** | **N=35<br>4.69<br>(1,12)** | **N=22<br>4.73<br>(1,12)** |
| **Per patient per year** | | | | |
| Number of hospitalisations for HS surgeries | | | | |
| Number of outpatient visits due to HS surgery | 0.11 | 0.26 | 0.75 | 0.78 |
| Number of non-surgical hospitalisations | 0.23 | 0.37 | 0.84 | 1.03 |
| Number of A&E visits | 0.12 | 0.30 | 0.38 | 0.42 |
| Number of surgery-related wound-care visits | 0.08 | 0.16 | 0.57 | 0.56 |
| Number of non-surgery-related wound-care visits | 0.15 | 0.15 | 0.51 | 1.23 |
| Number of routine outpatient visits | 0.35 | 0.31 | 0.56 | 0.43 |

Q= question from online survey
N= number of respondents
Min/Max=minimum/maximum

The same methodology described above for the moderate patients was used to estimate the number of events per patient per year for the severe group.

# Statistical outputs of ordered categorical NMA

## Base Case Analysis

## 11 March 2016

# Table of contents

# 1. Overview

Summary statistics obtained from WinBUGS output are presented in Sections 3 and 4 for each time point and response level. Both fixed-effect and random-effects results are presented; a total of 17 models were fitted to the data. Results for the parameters monitored within the analysis are presented in tabular format and show the mean, standard deviation (SD), Monte Carlo (MC) error, $50^{th}$ quantile (median), $2.5^{th}$ quantile, $97.5^{th}$ quantile, the burn-in period used and the number of iterations retained of which summary statistics are based upon. Model diagnostic plots are presented in Appendix A1 and Appendix A2 for fixed and random-effects results, respectively. These show the history trace plots for each chain and density plots for the relative treatment effect(s) ("d") and the standard deviation ("sd"). Autocorrelation is also assessed for the relative treatment effect(s).

# 2. Methods

The ordered categorical NMA was run using the code shown in example 6 of the DSU TSD2. Vague non-informative normal priors with a mean of 0 and a variance of 1000 were given to the study effects (mu) and treatment effects (d). The z.aux node was given a uniform prior between 0 and 5. The between-study standard deviation in the random-effects model was given a half-normal prior with a mean of 0 and a variance of $0.32^2$ as recommended in DSU TSD3. A less informative uniform prior was initially tested, however due to the fact the between-study variance needed to be estimated based on only 2 studies, a half-normal distribution proved to be a better modelling choice. A model was fitted for each starting health state and each transition time.

The models were fitted to the data via Bayesian Markov chain Monte Carlo (MCMC) methods (Gibbs sampling) and implemented in WinBUGS, version 1.4.3. They were run using 2 chains with different sets of initial values. For each analysis, an initial 20,000 iterations were run as a burn-in period to achieve convergence and then discarded. Results are based on a further 10,000 iterations (per chain), using a thinning interval of 10. Convergence towards sensible posterior distributions was assessed visually at the end of each simulation using the history trace plots, the smoothed Kernel posterior density plots. Autocorrelation plots were also checked to ensure the chains were mixing well and the magnitude of the MC error was compared to the standard deviation of the posterior distributions to ensure enough iterations had been saved. Both fixed-effect and random-effects models were run for each outcome. Their performances can be compared using the total residual deviance and the Deviance Information Criterion (DIC). A total of 20,000 CODA samples were retained and utilised directly in the cost-effectiveness model.

# 3. Fixed-effect models

## 3.1 Week 0-2

### 3.1.1 Non-response

**Table 1: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.4891 | 0.07628 | 6.14E-04 | 3.38E-01 | 0.489 | 0.6367 | 20001 | 20000 |
| T[1,1] | 0.3129 | 0.02697 | 2.17E-04 | 2.62E-01 | 0.3124 | 0.3678 | 20001 | 20000 |
| T[1,2] | 0.5779 | 0.04693 | 4.36E-04 | 4.85E-01 | 0.5783 | 0.6683 | 20001 | 20000 |
| T[2,1] | 0.1287 | 0.01905 | 1.50E-04 | 9.42E-02 | 0.1276 | 0.169 | 20001 | 20000 |
| T[2,2] | 0.3276 | 0.0453 | 4.28E-04 | 2.44E-01 | 0.326 | 0.4194 | 20001 | 20000 |
| T[3,1] | 0.04324 | 0.009687 | 7.76E-05 | 2.68E-02 | 0.04236 | 0.06459 | 20001 | 20000 |
| T[3,2] | 0.1521 | 0.03162 | 3.06E-04 | 9.69E-02 | 0.1498 | 0.22 | 20001 | 20000 |
| TP[1,1] | 0.6871 | 0.02697 | 2.17E-04 | 6.32E-01 | 0.6876 | 0.7379 | 20001 | 20000 |
| TP[1,2] | 0.1842 | 0.01515 | 1.19E-04 | 1.56E-01 | 0.1839 | 0.215 | 20001 | 20000 |
| TP[1,3] | 0.08547 | 0.01222 | 9.44E-05 | 6.34E-02 | 0.08485 | 0.1114 | 20001 | 20000 |
| TP[1,4] | 0.04324 | 0.009687 | 7.76E-05 | 2.68E-02 | 0.04236 | 0.06459 | 20001 | 20000 |
| TP[2,1] | 0.4221 | 0.04693 | 4.36E-04 | 3.32E-01 | 0.4217 | 0.5151 | 20001 | 20000 |
| TP[2,2] | 0.2503 | 0.01863 | 1.41E-04 | 2.15E-01 | 0.25 | 0.2878 | 20001 | 20000 |
| TP[2,3] | 0.1755 | 0.02169 | 1.78E-04 | 1.35E-01 | 0.1748 | 0.2196 | 20001 | 20000 |
| TP[2,4] | 0.1521 | 0.03162 | 3.06E-04 | 9.69E-02 | 0.1498 | 0.22 | 20001 | 20000 |
| d[2] | -0.687 | 0.09377 | 9.10E-04 | -8.74E-01 | -0.6871 | -0.5029 | 20001 | 20000 |
| totresdev | 23.24 | 3.119 | 2.48E-02 | 19.08 | 22.61 | 30.96 | 20001 | 20000 |
| z[2] | 0.6481 | 0.04954 | 3.75E-04 | 5.53E-01 | 0.6469 | 0.7483 | 20001 | 20000 |
| z[3] | 1.235 | 0.07178 | 5.41E-04 | 1.10E+00 | 1.233 | 1.378 | 20001 | 20000 |

**Table 2: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 79.072 | 74.117 | 4.955 | 84.028 |
| total | 79.072 | 74.117 | 4.955 | 84.028 |

## 3.2 Week 2-4

### 3.2.1 Non response

**Table 3: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.6251 | 0.09524 | 6.95E-04 | 4.40E-01 | 0.6241 | 0.8124 | 20001 | 20000 |
| T[1,1] | 0.2669 | 0.03118 | 2.28E-04 | 2.08E-01 | 0.2663 | 0.3301 | 20001 | 20000 |
| T[1,2] | 0.4525 | 0.06484 | 6.00E-04 | 3.28E-01 | 0.452 | 0.5812 | 20001 | 20000 |
| T[2,1] | 0.1024 | 0.02125 | 1.66E-04 | 6.48E-02 | 0.1009 | 0.148 | 20001 | 20000 |
| T[2,2] | 0.2234 | 0.05252 | 5.01E-04 | 1.30E-01 | 0.2195 | 0.3357 | 20001 | 20000 |
| T[3,1] | 0.0307 | 0.01026 | 8.11E-05 | 1.42E-02 | 0.02941 | 0.05416 | 20001 | 20000 |
| T[3,2] | 0.08677 | 0.03094 | 3.01E-04 | 3.78E-02 | 0.08282 | 0.1573 | 20001 | 20000 |
| TP[1,1] | 0.7331 | 0.03118 | 2.28E-04 | 6.70E-01 | 0.7337 | 0.7917 | 20001 | 20000 |
| TP[1,2] | 0.1645 | 0.01913 | 1.34E-04 | 1.29E-01 | 0.1638 | 0.2037 | 20001 | 20000 |
| TP[1,3] | 0.07172 | 0.01514 | 1.12E-04 | 4.50E-02 | 0.07061 | 0.1043 | 20001 | 20000 |
| TP[1,4] | 0.0307 | 0.01026 | 8.11E-05 | 1.42E-02 | 0.02941 | 0.05416 | 20001 | 20000 |
| TP[2,1] | 0.5475 | 0.06484 | 6.00E-04 | 4.19E-01 | 0.548 | 0.672 | 20001 | 20000 |
| TP[2,2] | 0.2291 | 0.02739 | 2.03E-04 | 1.77E-01 | 0.2285 | 0.2845 | 20001 | 20000 |
| TP[2,3] | 0.1366 | 0.03007 | 2.46E-04 | 8.28E-02 | 0.1349 | 0.2009 | 20001 | 20000 |
| TP[2,4] | 0.08677 | 0.03094 | 3.01E-04 | 3.78E-02 | 0.08282 | 0.1573 | 20001 | 20000 |
| d[2] | -0.504 | 0.1368 | 1.32E-03 | -7.71E-01 | -0.5035 | -0.2383 | 20001 | 20000 |
| totresdev | 11.04 | 3.196 | 2.36E-02 | 6.856 | 10.38 | 18.88 | 20001 | 20000 |
| z[2] | 0.6519 | 0.07196 | 5.46E-04 | 5.17E-01 | 0.6499 | 0.7989 | 20001 | 20000 |
| z[3] | 1.266 | 0.1135 | 8.25E-04 | 1.05E+00 | 1.263 | 1.498 | 20001 | 20000 |

**Table 4: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 56.85 | 51.837 | 5.013 | 61.863 |
| total | 56.85 | 51.837 | 5.013 | 61.863 |

### 3.2.2 Partial response

**Table 5: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.5462 | 0.1858 | 1.45E-03 | -9.17E-01 | -0.5448 | -0.187 | 20001 | 20000 |
| T[1,1] | 0.7044 | 0.06316 | 4.92E-04 | 5.74E-01 | 0.7071 | 0.8206 | 20001 | 20000 |
| T[1,2] | 0.8389 | 0.06391 | 5.51E-04 | 6.92E-01 | 0.8472 | 0.9399 | 20001 | 20000 |
| T[2,1] | 0.2191 | 0.06755 | 5.26E-04 | 1.06E-01 | 0.213 | 0.3697 | 20001 | 20000 |
| T[2,2] | 0.3801 | 0.1061 | 9.35E-04 | 1.87E-01 | 0.3747 | 0.5983 | 20001 | 20000 |
| T[3,1] | 0.05202 | 0.02803 | 2.11E-04 | 1.43E-02 | 0.04685 | 0.1212 | 20001 | 20000 |
| T[3,2] | 0.1254 | 0.0627 | 5.51E-04 | 3.58E-02 | 0.1142 | 0.2771 | 20001 | 20000 |
| TP[1,1] | 0.2956 | 0.06316 | 4.92E-04 | 1.80E-01 | 0.293 | 0.4258 | 20001 | 20000 |
| TP[1,2] | 0.4852 | 0.04249 | 3.01E-04 | 4.00E-01 | 0.4852 | 0.5683 | 20001 | 20000 |
| TP[1,3] | 0.1671 | 0.04689 | 3.57E-04 | 8.57E-02 | 0.1636 | 0.2684 | 20001 | 20000 |
| TP[1,4] | 0.05202 | 0.02803 | 2.11E-04 | 1.43E-02 | 0.04685 | 0.1212 | 20001 | 20000 |
| TP[2,1] | 0.1611 | 0.06391 | 5.51E-04 | 6.01E-02 | 0.1528 | 0.3083 | 20001 | 20000 |
| TP[2,2] | 0.4587 | 0.06121 | 4.95E-04 | 3.27E-01 | 0.4633 | 0.568 | 20001 | 20000 |
| TP[2,3] | 0.2547 | 0.05942 | 4.71E-04 | 1.41E-01 | 0.2535 | 0.3729 | 20001 | 20000 |
| TP[2,4] | 0.1254 | 0.0627 | 5.51E-04 | 3.58E-02 | 0.1142 | 0.2771 | 20001 | 20000 |
| d[2] | -0.4782 | 0.1908 | 1.95E-03 | -8.54E-01 | -0.479 | -0.1051 | 20001 | 20000 |
| totresdev | 7.868 | 3.178 | 2.41E-02 | 3.672 | 7.215 | 15.71 | 20001 | 20000 |
| z[2] | 1.342 | 0.1391 | 9.75E-04 | 1.08E+00 | 1.338 | 1.626 | 20001 | 20000 |
| z[3] | 2.226 | 0.182 | 1.23E-03 | 1.88E+00 | 2.223 | 2.588 | 20001 | 20000 |

**Table 6: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.871 | 41.86 | 5.011 | 51.882 |
| total | 46.871 | 41.86 | 5.011 | 51.882 |

### 3.2.3 Response

**Table 7: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.2995 | 0.302 | 2.43E-03 | -8.96E-01 | -0.2992 | 0.2899 | 20001 | 20000 |
| T[1,1] | 0.6128 | 0.1109 | 8.93E-04 | 3.86E-01 | 0.6176 | 0.815 | 20001 | 20000 |
| T[1,2] | 0.7718 | 0.1172 | 1.37E-03 | 5.02E-01 | 0.7902 | 0.9491 | 20001 | 20000 |
| T[2,1] | 0.3181 | 0.114 | 9.20E-04 | 1.23E-01 | 0.3091 | 0.5642 | 20001 | 20000 |
| T[2,2] | 0.5027 | 0.1578 | 1.88E-03 | 2.03E-01 | 0.5017 | 0.8036 | 20001 | 20000 |
| T[3,1] | 0.1048 | 0.06323 | 4.99E-04 | 2.17E-02 | 0.09158 | 0.2613 | 20001 | 20000 |
| T[3,2] | 0.2252 | 0.1243 | 1.44E-03 | 4.69E-02 | 0.2038 | 0.5185 | 20001 | 20000 |
| TP[1,1] | 0.3872 | 0.1109 | 8.93E-04 | 1.85E-01 | 0.3824 | 0.6141 | 20001 | 20000 |
| TP[1,2] | 0.2947 | 0.05339 | 3.92E-04 | 1.96E-01 | 0.2932 | 0.4029 | 20001 | 20000 |
| TP[1,3] | 0.2133 | 0.06349 | 4.96E-04 | 9.55E-02 | 0.2119 | 0.3419 | 20001 | 20000 |
| TP[1,4] | 0.1048 | 0.06323 | 4.99E-04 | 2.17E-02 | 0.09158 | 0.2613 | 20001 | 20000 |
| TP[2,1] | 0.2282 | 0.1172 | 1.37E-03 | 5.09E-02 | 0.2098 | 0.4983 | 20001 | 20000 |
| TP[2,2] | 0.2691 | 0.06785 | 6.53E-04 | 1.32E-01 | 0.2707 | 0.3987 | 20001 | 20000 |
| TP[2,3] | 0.2775 | 0.06412 | 6.03E-04 | 1.45E-01 | 0.2794 | 0.3988 | 20001 | 20000 |
| TP[2,4] | 0.2252 | 0.1243 | 1.44E-03 | 4.69E-02 | 0.2038 | 0.5185 | 20001 | 20000 |
| d[2] | -0.5063 | 0.2791 | 3.88E-03 | -1.05E+00 | -0.5065 | 0.0404 | 20001 | 20000 |
| totresdev | 10.77 | 3.14 | 2.68E-02 | 6.638 | 10.14 | 18.68 | 20001 | 20000 |
| z[2] | 0.7982 | 0.1472 | 1.11E-03 | 5.34E-01 | 0.7906 | 1.108 | 20001 | 20000 |
| z[3] | 1.631 | 0.1902 | 1.37E-03 | 1.28E+00 | 1.625 | 2.018 | 20001 | 20000 |

**Table 8: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 44.367 | 39.413 | 4.954 | 49.321 |
| total | 44.367 | 39.413 | 4.954 | 49.321 |

### 3.2.4 High Response

**Table 9: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.281 | 0.4482 | 3.37E-03 | -2.16E+00 | -1.28 | -0.4061 | 20001 | 20000 |
| T[1,1] | 0.8789 | 0.08697 | 6.60E-04 | 6.58E-01 | 0.8998 | 0.9845 | 20001 | 20000 |
| T[1,2] | 0.8938 | 0.09631 | 8.76E-04 | 6.34E-01 | 0.9233 | 0.994 | 20001 | 20000 |
| T[2,1] | 0.6787 | 0.1635 | 1.24E-03 | 3.16E-01 | 0.6995 | 0.9334 | 20001 | 20000 |
| T[2,2] | 0.7152 | 0.1775 | 1.74E-03 | 3.05E-01 | 0.7458 | 0.9669 | 20001 | 20000 |
| T[3,1] | 0.4807 | 0.1833 | 1.36E-03 | 1.43E-01 | 0.4792 | 0.8272 | 20001 | 20000 |
| T[3,2] | 0.5297 | 0.2068 | 2.03E-03 | 1.34E-01 | 0.5345 | 0.8997 | 20001 | 20000 |
| TP[1,1] | 0.1211 | 0.08697 | 6.60E-04 | 1.55E-02 | 0.1002 | 0.3423 | 20001 | 20000 |
| TP[1,2] | 0.2002 | 0.09801 | 7.44E-04 | 4.46E-02 | 0.1887 | 0.4165 | 20001 | 20000 |
| TP[1,3] | 0.198 | 0.06052 | 4.28E-04 | 8.63E-02 | 0.1955 | 0.3224 | 20001 | 20000 |
| TP[1,4] | 0.4807 | 0.1833 | 1.36E-03 | 1.43E-01 | 0.4792 | 0.8272 | 20001 | 20000 |
| TP[2,1] | 0.1062 | 0.09631 | 8.76E-04 | 6.05E-03 | 0.07675 | 0.3662 | 20001 | 20000 |
| TP[2,2] | 0.1786 | 0.1015 | 9.72E-04 | 2.51E-02 | 0.1655 | 0.4037 | 20001 | 20000 |
| TP[2,3] | 0.1855 | 0.06568 | 5.19E-04 | 5.88E-02 | 0.1842 | 0.318 | 20001 | 20000 |
| TP[2,4] | 0.5297 | 0.2068 | 2.03E-03 | 1.34E-01 | 0.5345 | 0.8997 | 20001 | 20000 |
| d[2] | -0.142 | 0.3268 | 3.83E-03 | -7.84E-01 | -0.1416 | 0.4967 | 20001 | 20000 |
| totresdev | 13.11 | 3.16 | 2.67E-02 | 8.931 | 12.46 | 21 | 20001 | 20000 |
| z[2] | 0.7627 | 0.2252 | 1.76E-03 | 3.82E-01 | 0.7431 | 1.257 | 20001 | 20000 |
| z[3] | 1.337 | 0.252 | 2.02E-03 | 8.84E-01 | 1.322 | 1.867 | 20001 | 20000 |

**Table 10: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 38.835 | 33.924 | 4.911 | 43.746 |
| total | 38.835 | 33.924 | 4.911 | 43.746 |

## 3.3 Week 4-8

### 3.3.1 Non response

**Table 11: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.6538 | 0.1035 | 7.48E-04 | 4.50E-01 | 0.6542 | 0.8564 | 20001 | 20000 |
| T[1,1] | 0.2577 | 0.03327 | 2.41E-04 | 1.96E-01 | 0.2565 | 0.3265 | 20001 | 20000 |
| T[1,2] | 0.4228 | 0.07176 | 5.64E-04 | 2.86E-01 | 0.4215 | 0.5657 | 20001 | 20000 |
| T[2,1] | 0.08012 | 0.0205 | 1.44E-04 | 4.49E-02 | 0.07825 | 0.1258 | 20001 | 20000 |
| T[2,2] | 0.173 | 0.05166 | 4.05E-04 | 8.56E-02 | 0.1679 | 0.2865 | 20001 | 20000 |
| T[3,1] | 0.03396 | 0.01238 | 9.31E-05 | 1.47E-02 | 0.03238 | 0.0624 | 20001 | 20000 |
| T[3,2] | 0.08666 | 0.0346 | 2.76E-04 | 3.36E-02 | 0.08192 | 0.1669 | 20001 | 20000 |
| TP[1,1] | 0.7423 | 0.03327 | 2.41E-04 | 6.74E-01 | 0.7435 | 0.8041 | 20001 | 20000 |
| TP[1,2] | 0.1776 | 0.02232 | 1.56E-04 | 1.36E-01 | 0.1768 | 0.2234 | 20001 | 20000 |
| TP[1,3] | 0.04616 | 0.01294 | 9.08E-05 | 2.45E-02 | 0.04488 | 0.07458 | 20001 | 20000 |
| TP[1,4] | 0.03396 | 0.01238 | 9.31E-05 | 1.47E-02 | 0.03238 | 0.0624 | 20001 | 20000 |
| TP[2,1] | 0.5772 | 0.07176 | 5.64E-04 | 4.34E-01 | 0.5785 | 0.7138 | 20001 | 20000 |
| TP[2,2] | 0.2498 | 0.0348 | 2.48E-04 | 1.83E-01 | 0.2495 | 0.3202 | 20001 | 20000 |
| TP[2,3] | 0.08635 | 0.02603 | 1.97E-04 | 4.29E-02 | 0.08394 | 0.1439 | 20001 | 20000 |
| TP[2,4] | 0.08666 | 0.0346 | 2.76E-04 | 3.36E-02 | 0.08192 | 0.1669 | 20001 | 20000 |
| d[2] | -0.4558 | 0.157 | 1.34E-03 | -7.61E-01 | -0.4556 | -0.1517 | 20001 | 20000 |
| totresdev | 7.038 | 3.146 | 2.40E-02 | 2.855 | 6.41 | 14.7 | 20001 | 20000 |
| z[2] | 0.7638 | 0.09099 | 6.04E-04 | 5.93E-01 | 0.7604 | 0.9497 | 20001 | 20000 |
| z[3] | 1.196 | 0.1277 | 9.66E-04 | 9.59E-01 | 1.192 | 1.46 | 20001 | 20000 |

**Table 12: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 48.546 | 43.594 | 4.952 | 53.498 |
| total | 48.546 | 43.594 | 4.952 | 53.498 |

### 3.3.2 Partial response

**Table 13: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6872 | 0.1838 | 1.43E-03 | -1.05E+00 | -0.6884 | -0.3244 | 20001 | 20000 |
| T[1,1] | 0.7505 | 0.05768 | 4.44E-04 | 6.27E-01 | 0.7544 | 0.8524 | 20001 | 20000 |
| T[1,2] | 0.8152 | 0.06623 | 6.21E-04 | 6.69E-01 | 0.8228 | 0.9229 | 20001 | 20000 |
| T[2,1] | 0.3049 | 0.07516 | 5.62E-04 | 1.68E-01 | 0.3013 | 0.4615 | 20001 | 20000 |
| T[2,2] | 0.392 | 0.102 | 9.41E-04 | 2.04E-01 | 0.3892 | 0.6001 | 20001 | 20000 |
| T[3,1] | 0.1318 | 0.04963 | 3.69E-04 | 5.28E-02 | 0.1253 | 0.2449 | 20001 | 20000 |
| T[3,2] | 0.1907 | 0.07574 | 6.82E-04 | 7.03E-02 | 0.1819 | 0.3624 | 20001 | 20000 |
| TP[1,1] | 0.2495 | 0.05768 | 4.44E-04 | 1.48E-01 | 0.2456 | 0.3728 | 20001 | 20000 |
| TP[1,2] | 0.4456 | 0.04213 | 2.99E-04 | 3.60E-01 | 0.4465 | 0.5247 | 20001 | 20000 |
| TP[1,3] | 0.1731 | 0.03816 | 2.82E-04 | 1.03E-01 | 0.1715 | 0.2523 | 20001 | 20000 |
| TP[1,4] | 0.1318 | 0.04963 | 3.69E-04 | 5.28E-02 | 0.1253 | 0.2449 | 20001 | 20000 |
| TP[2,1] | 0.1848 | 0.06623 | 6.21E-04 | 7.71E-02 | 0.1772 | 0.3315 | 20001 | 20000 |
| TP[2,2] | 0.4232 | 0.05339 | 4.31E-04 | 3.08E-01 | 0.4267 | 0.5186 | 20001 | 20000 |
| TP[2,3] | 0.2013 | 0.04299 | 3.60E-04 | 1.19E-01 | 0.2002 | 0.2881 | 20001 | 20000 |
| TP[2,4] | 0.1907 | 0.07574 | 6.82E-04 | 7.03E-02 | 0.1819 | 0.3624 | 20001 | 20000 |
| d[2] | -0.2381 | 0.1747 | 1.92E-03 | -5.81E-01 | -0.2381 | 0.1039 | 20001 | 20000 |
| totresdev | 12.77 | 3.094 | 2.26E-02 | 8.631 | 12.15 | 20.42 | 20001 | 20000 |
| z[2] | 1.21 | 0.1189 | 8.31E-04 | 9.85E-01 | 1.206 | 1.447 | 20001 | 20000 |
| z[3] | 1.836 | 0.146 | 1.01E-03 | 1.56E+00 | 1.834 | 2.131 | 20001 | 20000 |

**Table 14: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 54.108 | 49.151 | 4.957 | 59.065 |
| total | 54.108 | 49.151 | 4.957 | 59.065 |

### 3.3.3 Response

**Table 15: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.236 | 0.3171 | 2.13E-03 | -1.86E+00 | -1.236 | -0.6133 | 20001 | 20000 |
| T[1,1] | 0.8806 | 0.06208 | 4.21E-04 | 7.31E-01 | 0.8917 | 0.9682 | 20001 | 20000 |
| T[1,2] | 0.8843 | 0.07308 | 6.17E-04 | 7.00E-01 | 0.8991 | 0.9798 | 20001 | 20000 |
| T[2,1] | 0.6688 | 0.1208 | 8.44E-04 | 4.11E-01 | 0.6783 | 0.8739 | 20001 | 20000 |
| T[2,2] | 0.6812 | 0.1371 | 1.23E-03 | 3.83E-01 | 0.6936 | 0.9071 | 20001 | 20000 |
| T[3,1] | 0.33 | 0.1253 | 8.79E-04 | 1.16E-01 | 0.3199 | 0.5978 | 20001 | 20000 |
| T[3,2] | 0.3489 | 0.1459 | 1.30E-03 | 1.06E-01 | 0.3359 | 0.6619 | 20001 | 20000 |
| TP[1,1] | 0.1194 | 0.06208 | 4.21E-04 | 3.18E-02 | 0.1083 | 0.2698 | 20001 | 20000 |
| TP[1,2] | 0.2118 | 0.07132 | 5.23E-04 | 8.71E-02 | 0.2082 | 0.3617 | 20001 | 20000 |
| TP[1,3] | 0.3389 | 0.05136 | 3.47E-04 | 2.37E-01 | 0.339 | 0.4388 | 20001 | 20000 |
| TP[1,4] | 0.33 | 0.1253 | 8.79E-04 | 1.16E-01 | 0.3199 | 0.5978 | 20001 | 20000 |
| TP[2,1] | 0.1157 | 0.07308 | 6.17E-04 | 2.02E-02 | 0.1009 | 0.2997 | 20001 | 20000 |
| TP[2,2] | 0.2031 | 0.07648 | 6.87E-04 | 6.81E-02 | 0.1995 | 0.3604 | 20001 | 20000 |
| TP[2,3] | 0.3323 | 0.0554 | 3.89E-04 | 2.18E-01 | 0.3337 | 0.4365 | 20001 | 20000 |
| TP[2,4] | 0.3489 | 0.1459 | 1.30E-03 | 1.06E-01 | 0.3359 | 0.6619 | 20001 | 20000 |
| d[2] | -0.04711 | 0.2231 | 2.45E-03 | -4.84E-01 | -0.04715 | 0.3956 | 20001 | 20000 |
| totresdev | 14.24 | 3.177 | 2.64E-02 | 10.09 | 13.57 | 22.03 | 20001 | 20000 |
| z[2] | 0.7733 | 0.1492 | 1.17E-03 | 5.06E-01 | 0.7656 | 1.086 | 20001 | 20000 |
| z[3] | 1.705 | 0.1839 | 1.40E-03 | 1.36E+00 | 1.697 | 2.084 | 20001 | 20000 |

**Table 16: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 49.988 | 45.056 | 4.932 | 54.92 |
| total | 49.988 | 45.056 | 4.932 | 54.92 |

### 3.3.4 High Response

**Table 17: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.069 | 0.3351 | 2.51E-03 | -1.73E+00 | -1.068 | -0.4138 | 20001 | 20000 |
| T[1,1] | 0.8445 | 0.07802 | 5.98E-04 | 6.61E-01 | 0.8574 | 0.9579 | 20001 | 20000 |
| T[1,2] | 0.9383 | 0.05276 | 4.85E-04 | 7.97E-01 | 0.9533 | 0.9942 | 20001 | 20000 |
| T[2,1] | 0.659 | 0.1287 | 1.01E-03 | 3.84E-01 | 0.6703 | 0.8765 | 20001 | 20000 |
| T[2,2] | 0.8296 | 0.1091 | 1.06E-03 | 5.65E-01 | 0.8523 | 0.9733 | 20001 | 20000 |
| T[3,1] | 0.5485 | 0.1407 | 1.11E-03 | 2.68E-01 | 0.5532 | 0.8073 | 20001 | 20000 |
| T[3,2] | 0.7494 | 0.1352 | 1.34E-03 | 4.39E-01 | 0.77 | 0.9492 | 20001 | 20000 |
| TP[1,1] | 0.1555 | 0.07802 | 5.98E-04 | 4.22E-02 | 0.1427 | 0.3395 | 20001 | 20000 |
| TP[1,2] | 0.1855 | 0.06938 | 5.41E-04 | 6.90E-02 | 0.1789 | 0.3362 | 20001 | 20000 |
| TP[1,3] | 0.1105 | 0.03802 | 2.70E-04 | 4.71E-02 | 0.1068 | 0.1947 | 20001 | 20000 |
| TP[1,4] | 0.5485 | 0.1407 | 1.11E-03 | 2.68E-01 | 0.5532 | 0.8073 | 20001 | 20000 |
| TP[2,1] | 0.06169 | 0.05276 | 4.85E-04 | 5.78E-03 | 0.0467 | 0.203 | 20001 | 20000 |
| TP[2,2] | 0.1087 | 0.06468 | 6.19E-04 | 1.87E-02 | 0.09679 | 0.2635 | 20001 | 20000 |
| TP[2,3] | 0.08022 | 0.03861 | 3.41E-04 | 2.00E-02 | 0.07546 | 0.1674 | 20001 | 20000 |
| TP[2,4] | 0.7494 | 0.1352 | 1.34E-03 | 4.39E-01 | 0.77 | 0.9492 | 20001 | 20000 |
| d[2] | -0.6097 | 0.2748 | 3.09E-03 | -1.15E+00 | -0.6085 | -0.06836 | 20001 | 20000 |
| totresdev | 12.85 | 3.155 | 2.52E-02 | 8.681 | 12.2 | 20.56 | 20001 | 20000 |
| z[2] | 0.6318 | 0.1618 | 1.22E-03 | 3.49E-01 | 0.6198 | 0.9841 | 20001 | 20000 |
| z[3] | 0.9385 | 0.1796 | 1.40E-03 | 6.19E-01 | 0.9286 | 1.316 | 20001 | 20000 |

**Table 18: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.391 | 37.521 | 4.87 | 47.261 |
| total | 42.391 | 37.521 | 4.87 | 47.261 |

## 3.4 Week 8-12

### 3.4.1 Non response

**Table 19: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.7098 | 0.1135 | 8.61E-04 | 4.88E-01 | 0.7094 | 0.9286 | 20001 | 20000 |
| T[1,1] | 0.2403 | 0.03513 | 2.65E-04 | 1.77E-01 | 0.239 | 0.3129 | 20001 | 20000 |
| T[1,2] | 0.2193 | 0.06199 | 5.05E-04 | 1.13E-01 | 0.2138 | 0.3533 | 20001 | 20000 |
| T[2,1] | 0.0964 | 0.02493 | 1.76E-04 | 5.33E-02 | 0.09435 | 0.1496 | 20001 | 20000 |
| T[2,2] | 0.08664 | 0.03672 | 2.88E-04 | 3.13E-02 | 0.08104 | 0.1747 | 20001 | 20000 |
| T[3,1] | 0.03927 | 0.01537 | 1.08E-04 | 1.56E-02 | 0.03718 | 0.07461 | 20001 | 20000 |
| T[3,2] | 0.035 | 0.02004 | 1.58E-04 | 8.85E-03 | 0.03073 | 0.08432 | 20001 | 20000 |
| TP[1,1] | 0.7597 | 0.03513 | 2.65E-04 | 6.87E-01 | 0.761 | 0.8235 | 20001 | 20000 |
| TP[1,2] | 0.1439 | 0.02263 | 1.76E-04 | 1.03E-01 | 0.1426 | 0.1909 | 20001 | 20000 |
| TP[1,3] | 0.05713 | 0.01672 | 1.20E-04 | 2.92E-02 | 0.05559 | 0.0936 | 20001 | 20000 |
| TP[1,4] | 0.03927 | 0.01537 | 1.08E-04 | 1.56E-02 | 0.03718 | 0.07461 | 20001 | 20000 |
| TP[2,1] | 0.7807 | 0.06199 | 5.05E-04 | 6.47E-01 | 0.7862 | 0.8871 | 20001 | 20000 |
| TP[2,2] | 0.1327 | 0.03233 | 2.63E-04 | 7.49E-02 | 0.1309 | 0.2008 | 20001 | 20000 |
| TP[2,3] | 0.05165 | 0.02143 | 1.63E-04 | 1.93E-02 | 0.04838 | 0.1015 | 20001 | 20000 |
| TP[2,4] | 0.035 | 0.02004 | 1.58E-04 | 8.85E-03 | 0.03073 | 0.08432 | 20001 | 20000 |
| d[2] | 0.08202 | 0.1807 | 1.66E-03 | -2.73E-01 | 0.08299 | 0.4363 | 20001 | 20000 |
| totresdev | 10.14 | 3.15 | 2.23E-02 | 6.007 | 9.5 | 17.97 | 20001 | 20000 |
| z[2] | 0.6066 | 0.09489 | 6.75E-04 | 4.35E-01 | 0.6018 | 0.8063 | 20001 | 20000 |
| z[3] | 1.078 | 0.145 | 9.96E-04 | 8.13E-01 | 1.072 | 1.38 | 20001 | 20000 |

**Table 20: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.753 | 41.839 | 4.914 | 51.667 |
| total | 46.753 | 41.839 | 4.914 | 51.667 |

### 3.4.2 Partial response

**Table 21: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.5106 | 0.1537 | 1.09E-03 | -8.13E-01 | -0.5089 | -0.2129 | 20001 | 20000 |
| T[1,1] | 0.6931 | 0.05338 | 3.80E-04 | 5.84E-01 | 0.6946 | 0.792 | 20001 | 20000 |
| T[1,2] | 0.7489 | 0.07222 | 5.96E-04 | 5.94E-01 | 0.7543 | 0.8733 | 20001 | 20000 |
| T[2,1] | 0.2826 | 0.06397 | 4.28E-04 | 1.68E-01 | 0.2795 | 0.4155 | 20001 | 20000 |
| T[2,2] | 0.3463 | 0.09073 | 7.26E-04 | 1.82E-01 | 0.3419 | 0.5346 | 20001 | 20000 |
| T[3,1] | 0.1032 | 0.03805 | 2.52E-04 | 4.31E-02 | 0.09819 | 0.1917 | 20001 | 20000 |
| T[3,2] | 0.141 | 0.05915 | 4.60E-04 | 4.95E-02 | 0.1331 | 0.2776 | 20001 | 20000 |
| TP[1,1] | 0.3069 | 0.05338 | 3.80E-04 | 2.08E-01 | 0.3054 | 0.4157 | 20001 | 20000 |
| TP[1,2] | 0.4105 | 0.03826 | 2.71E-04 | 3.35E-01 | 0.4102 | 0.4849 | 20001 | 20000 |
| TP[1,3] | 0.1794 | 0.03773 | 2.56E-04 | 1.10E-01 | 0.1775 | 0.2581 | 20001 | 20000 |
| TP[1,4] | 0.1032 | 0.03805 | 2.52E-04 | 4.31E-02 | 0.09819 | 0.1917 | 20001 | 20000 |
| TP[2,1] | 0.2511 | 0.07222 | 5.96E-04 | 1.27E-01 | 0.2457 | 0.4062 | 20001 | 20000 |
| TP[2,2] | 0.4025 | 0.04356 | 3.17E-04 | 3.14E-01 | 0.4032 | 0.4843 | 20001 | 20000 |
| TP[2,3] | 0.2053 | 0.04535 | 3.38E-04 | 1.20E-01 | 0.2043 | 0.2981 | 20001 | 20000 |
| TP[2,4] | 0.141 | 0.05915 | 4.60E-04 | 4.95E-02 | 0.1331 | 0.2776 | 20001 | 20000 |
| d[2] | -0.1781 | 0.1732 | 1.47E-03 | -5.17E-01 | -0.1777 | 0.1633 | 20001 | 20000 |
| totresdev | 13.05 | 3.181 | 2.45E-02 | 8.838 | 12.39 | 20.81 | 20001 | 20000 |
| z[2] | 1.096 | 0.1138 | 8.01E-04 | 8.83E-01 | 1.092 | 1.325 | 20001 | 20000 |
| z[3] | 1.803 | 0.1468 | 1.06E-03 | 1.52E+00 | 1.799 | 2.1 | 20001 | 20000 |

**Table 22: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 55.364 | 50.339 | 5.026 | 60.39 |
| total | 55.364 | 50.339 | 5.026 | 60.39 |

### 3.4.3 Response

**Table 23: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.8415 | 0.2882 | 2.27E-03 | -1.40E+00 | -0.8439 | -0.2751 | 20001 | 20000 |
| T[1,1] | 0.7906 | 0.08085 | 6.35E-04 | 6.09E-01 | 0.8006 | 0.9195 | 20001 | 20000 |
| T[1,2] | 0.8423 | 0.08757 | 8.58E-04 | 6.30E-01 | 0.8583 | 0.9641 | 20001 | 20000 |
| T[2,1] | 0.6542 | 0.1108 | 8.69E-04 | 4.22E-01 | 0.6619 | 0.8457 | 20001 | 20000 |
| T[2,2] | 0.7263 | 0.1239 | 1.25E-03 | 4.46E-01 | 0.7415 | 0.9199 | 20001 | 20000 |
| T[3,1] | 0.2914 | 0.1106 | 8.90E-04 | 1.06E-01 | 0.2822 | 0.5295 | 20001 | 20000 |
| T[3,2] | 0.3735 | 0.1445 | 1.52E-03 | 1.22E-01 | 0.365 | 0.6741 | 20001 | 20000 |
| TP[1,1] | 0.2094 | 0.08085 | 6.35E-04 | 8.05E-02 | 0.1994 | 0.3916 | 20001 | 20000 |
| TP[1,2] | 0.1365 | 0.04855 | 3.68E-04 | 5.60E-02 | 0.1315 | 0.245 | 20001 | 20000 |
| TP[1,3] | 0.3627 | 0.05348 | 3.58E-04 | 2.58E-01 | 0.3623 | 0.4684 | 20001 | 20000 |
| TP[1,4] | 0.2914 | 0.1106 | 8.90E-04 | 1.06E-01 | 0.2822 | 0.5295 | 20001 | 20000 |
| TP[2,1] | 0.1577 | 0.08757 | 8.58E-04 | 3.59E-02 | 0.1417 | 0.3702 | 20001 | 20000 |
| TP[2,2] | 0.1161 | 0.05005 | 4.67E-04 | 3.65E-02 | 0.1099 | 0.2289 | 20001 | 20000 |
| TP[2,3] | 0.3527 | 0.06086 | 4.90E-04 | 2.25E-01 | 0.3551 | 0.4673 | 20001 | 20000 |
| TP[2,4] | 0.3735 | 0.1445 | 1.52E-03 | 1.22E-01 | 0.365 | 0.6741 | 20001 | 20000 |
| d[2] | -0.2308 | 0.2423 | 2.82E-03 | -7.02E-01 | -0.2298 | 0.2481 | 20001 | 20000 |
| totresdev | 8.239 | 3.142 | 2.54E-02 | 4.129 | 7.585 | 16.02 | 20001 | 20000 |
| z[2] | 0.4262 | 0.1201 | 9.10E-04 | 2.20E-01 | 0.4152 | 0.691 | 20001 | 20000 |
| z[3] | 1.422 | 0.1776 | 1.33E-03 | 1.09E+00 | 1.416 | 1.787 | 20001 | 20000 |

**Table 24: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.769 | 37.866 | 4.903 | 47.673 |
| total | 42.769 | 37.866 | 4.903 | 47.673 |

### 3.4.4 High Response

**Table 25: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.966 | 0.253 | 1.81E-03 | -1.46E+00 | -0.9677 | -0.4754 | 20001 | 20000 |
| T[1,1] | 0.8255 | 0.06385 | 4.65E-04 | 6.83E-01 | 0.8334 | 0.9284 | 20001 | 20000 |
| T[1,2] | 0.9191 | 0.04922 | 4.43E-04 | 7.97E-01 | 0.9297 | 0.9833 | 20001 | 20000 |
| T[2,1] | 0.6577 | 0.1003 | 7.10E-04 | 4.48E-01 | 0.6638 | 0.8358 | 20001 | 20000 |
| T[2,2] | 0.8099 | 0.09129 | 8.59E-04 | 6.01E-01 | 0.8231 | 0.9461 | 20001 | 20000 |
| T[3,1] | 0.4124 | 0.1113 | 7.80E-04 | 2.08E-01 | 0.4079 | 0.6356 | 20001 | 20000 |
| T[3,2] | 0.6026 | 0.1304 | 1.25E-03 | 3.37E-01 | 0.6078 | 0.8362 | 20001 | 20000 |
| TP[1,1] | 0.1745 | 0.06385 | 4.65E-04 | 7.16E-02 | 0.1666 | 0.3172 | 20001 | 20000 |
| TP[1,2] | 0.1678 | 0.05244 | 3.77E-04 | 7.79E-02 | 0.1639 | 0.2817 | 20001 | 20000 |
| TP[1,3] | 0.2454 | 0.04224 | 2.93E-04 | 1.66E-01 | 0.2441 | 0.3317 | 20001 | 20000 |
| TP[1,4] | 0.4124 | 0.1113 | 7.80E-04 | 2.08E-01 | 0.4079 | 0.6356 | 20001 | 20000 |
| TP[2,1] | 0.08087 | 0.04922 | 4.43E-04 | 1.67E-02 | 0.07032 | 0.2027 | 20001 | 20000 |
| TP[2,2] | 0.1092 | 0.04979 | 4.57E-04 | 3.22E-02 | 0.1027 | 0.2234 | 20001 | 20000 |
| TP[2,3] | 0.2073 | 0.05371 | 4.71E-04 | 1.03E-01 | 0.2077 | 0.3121 | 20001 | 20000 |
| TP[2,4] | 0.6026 | 0.1304 | 1.25E-03 | 3.37E-01 | 0.6078 | 0.8362 | 20001 | 20000 |
| d[2] | -0.5075 | 0.2124 | 2.42E-03 | -9.21E-01 | -0.5074 | -0.09181 | 20001 | 20000 |
| totresdev | 9.807 | 3.142 | 2.43E-02 | 5.672 | 9.169 | 17.61 | 20001 | 20000 |
| z[2] | 0.5439 | 0.1255 | 9.37E-04 | 3.22E-01 | 0.5366 | 0.8158 | 20001 | 20000 |
| z[3] | 1.197 | 0.1556 | 1.19E-03 | 9.07E-01 | 1.193 | 1.517 | 20001 | 20000 |

**Table 26: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.299 | 41.374 | 4.926 | 51.225 |
| total | 46.299 | 41.374 | 4.926 | 51.225 |

## 3.5 Week 12-36

### 3.5.1 Non response

**Table 27: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 1.456 | 0.2486 | 1.69E-03 | 9.63E-01 | 1.457 | 1.945 | 20001 | 20000 |
| T[1,1] | 0.07888 | 0.03658 | 2.45E-04 | 2.59E-02 | 0.0725 | 0.1678 | 20001 | 20000 |
| T[1,2] | 0.2849 | 0.1437 | 1.51E-03 | 6.50E-02 | 0.2662 | 0.6041 | 20001 | 20000 |
| T[1,3] | 0.376 | 0.1561 | 1.65E-03 | 1.11E-01 | 0.3642 | 0.7054 | 20001 | 20000 |
| T[2,1] | 0.0344 | 0.02123 | 1.42E-04 | 7.67E-03 | 0.02962 | 0.08857 | 20001 | 20000 |
| T[2,2] | 0.1694 | 0.1116 | 1.13E-03 | 2.47E-02 | 0.1452 | 0.4421 | 20001 | 20000 |
| T[2,3] | 0.2396 | 0.1318 | 1.36E-03 | 4.91E-02 | 0.2173 | 0.5479 | 20001 | 20000 |
| T[3,1] | 0.01559 | 0.0121 | 8.64E-05 | 2.24E-03 | 0.0123 | 0.04733 | 20001 | 20000 |
| T[3,2] | 0.1008 | 0.08233 | 8.07E-04 | 9.30E-03 | 0.07838 | 0.3155 | 20001 | 20000 |
| T[3,3] | 0.1513 | 0.1043 | 1.07E-03 | 2.03E-02 | 0.1272 | 0.4175 | 20001 | 20000 |
| TP[1,1] | 0.9211 | 0.03658 | 2.45E-04 | 8.32E-01 | 0.9275 | 0.9741 | 20001 | 20000 |
| TP[1,2] | 0.04448 | 0.01978 | 1.36E-04 | 1.54E-02 | 0.04138 | 0.09146 | 20001 | 20000 |
| TP[1,3] | 0.01881 | 0.01172 | 7.84E-05 | 4.17E-03 | 0.01619 | 0.04831 | 20001 | 20000 |
| TP[1,4] | 0.01559 | 0.0121 | 8.64E-05 | 2.24E-03 | 0.0123 | 0.04733 | 20001 | 20000 |
| TP[2,1] | 0.7151 | 0.1437 | 1.51E-03 | 3.96E-01 | 0.7338 | 0.9351 | 20001 | 20000 |
| TP[2,2] | 0.1154 | 0.04787 | 4.50E-04 | 3.49E-02 | 0.1116 | 0.2193 | 20001 | 20000 |
| TP[2,3] | 0.0686 | 0.04078 | 3.82E-04 | 0.01194 | 0.06103 | 0.1677 | 20001 | 20000 |
| TP[2,4] | 0.1008 | 0.08233 | 8.07E-04 | 9.30E-03 | 0.07838 | 0.3155 | 20001 | 20000 |
| TP[3,1] | 0.624 | 0.1561 | 1.65E-03 | 2.95E-01 | 0.6358 | 0.8887 | 20001 | 20000 |
| TP[3,2] | 0.1364 | 0.04741 | 4.02E-04 | 0.0524 | 0.1338 | 0.2382 | 20001 | 20000 |
| TP[3,3] | 0.08834 | 0.04454 | 3.80E-04 | 0.02144 | 0.08174 | 0.192 | 20001 | 20000 |
| TP[3,4] | 0.1513 | 0.1043 | 1.07E-03 | 0.02031 | 0.1272 | 0.4175 | 20001 | 20000 |
| d[2] | -0.8306 | 0.3843 | 0.00435 | -1.6 | -0.8323 | -0.07224 | 20001 | 20000 |
| d[3] | -1.11 | 0.3701 | 0.004326 | -1.846 | -1.107 | -0.3966 | 20001 | 20000 |
| totresdev | 14.24 | 3.508 | 0.02699 | 9.456 | 13.59 | 22.65 | 20001 | 20000 |
| z[2] | 0.431 | 0.1169 | 8.25E-04 | 0.23 | 0.4211 | 0.6849 | 20001 | 20000 |
| z[3] | 0.792 | 0.1664 | 1.15E-03 | 0.4924 | 0.7816 | 1.146 | 20001 | 20000 |

**Table 28: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.404 | 40.522 | 5.882 | 52.286 |
| total | 46.404 | 40.522 | 5.882 | 52.286 |

### 3.5.2 Partial response

**Table 29: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.4068 | 0.2282 | 1.59E-03 | -4.02E-02 | 0.4068 | 0.8526 | 20001 | 20000 |
| T[1,1] | 0.3458 | 0.08225 | 5.72E-04 | 1.97E-01 | 0.3421 | 0.5161 | 20001 | 20000 |
| T[1,2] | 0.7729 | 0.126 | 1.15E-03 | 4.78E-01 | 0.7933 | 0.9552 | 20001 | 20000 |
| T[1,3] | 0.282 | 0.1472 | 1.39E-03 | 5.57E-02 | 0.2636 | 0.6066 | 20001 | 20000 |
| T[2,1] | 0.1696 | 0.06683 | 4.84E-04 | 6.15E-02 | 0.1618 | 0.3184 | 20001 | 20000 |
| T[2,2] | 0.5851 | 0.1605 | 1.44E-03 | 2.60E-01 | 0.5911 | 0.8679 | 20001 | 20000 |
| T[2,3] | 0.1369 | 0.1022 | 9.84E-04 | 1.29E-02 | 0.1119 | 0.3967 | 20001 | 20000 |
| T[3,1] | 0.07352 | 0.04176 | 3.14E-04 | 1.69E-02 | 0.06544 | 0.1768 | 20001 | 20000 |
| T[3,2] | 0.3964 | 0.161 | 1.42E-03 | 1.19E-01 | 0.384 | 0.7263 | 20001 | 20000 |
| T[3,3] | 0.06029 | 0.06053 | 5.78E-04 | 2.55E-03 | 0.04131 | 0.225 | 20001 | 20000 |
| TP[1,1] | 0.6542 | 0.08225 | 5.72E-04 | 4.84E-01 | 0.6579 | 0.8031 | 20001 | 20000 |
| TP[1,2] | 0.1762 | 0.04493 | 3.51E-04 | 9.81E-02 | 0.1732 | 0.2729 | 20001 | 20000 |
| TP[1,3] | 0.09607 | 0.03761 | 2.64E-04 | 3.59E-02 | 0.09149 | 0.1806 | 20001 | 20000 |
| TP[1,4] | 0.07352 | 0.04176 | 3.14E-04 | 1.69E-02 | 0.06544 | 0.1768 | 20001 | 20000 |
| TP[2,1] | 0.2271 | 0.126 | 1.15E-03 | 4.48E-02 | 0.2067 | 0.5223 | 20001 | 20000 |
| TP[2,2] | 0.1878 | 0.06282 | 4.97E-04 | 7.47E-02 | 0.1846 | 0.3202 | 20001 | 20000 |
| TP[2,3] | 0.1887 | 0.05836 | 4.14E-04 | 0.08842 | 0.1843 | 0.3148 | 20001 | 20000 |
| TP[2,4] | 0.3964 | 0.161 | 1.42E-03 | 1.19E-01 | 0.384 | 0.7263 | 20001 | 20000 |
| TP[3,1] | 0.718 | 0.1472 | 1.39E-03 | 3.94E-01 | 0.7364 | 0.9443 | 20001 | 20000 |
| TP[3,2] | 0.1451 | 0.062 | 5.30E-04 | 0.03813 | 0.1413 | 0.2753 | 20001 | 20000 |
| TP[3,3] | 0.07662 | 0.05001 | 4.49E-04 | 0.009325 | 0.06706 | 0.1951 | 20001 | 20000 |
| TP[3,4] | 0.06029 | 0.06053 | 5.78E-04 | 0.002554 | 0.04131 | 0.225 | 20001 | 20000 |
| d[2] | -1.227 | 0.3857 | 0.003982 | -1.984 | -1.226 | -0.4812 | 20001 | 20000 |
| d[3] | 0.2339 | 0.4229 | 0.004377 | -0.5791 | 0.2245 | 1.082 | 20001 | 20000 |
| totresdev | 19.7 | 3.443 | 0.02799 | 14.97 | 19.06 | 28.08 | 20001 | 20000 |
| z[2] | 0.5839 | 0.1494 | 1.22E-03 | 0.3248 | 0.5734 | 0.9058 | 20001 | 20000 |
| z[3] | 1.108 | 0.2008 | 1.60E-03 | 0.7401 | 1.099 | 1.527 | 20001 | 20000 |

**Table 30: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 47.783 | 41.918 | 5.865 | 53.649 |
| total | 47.783 | 41.918 | 5.865 | 53.649 |

### 3.5.3 Response

**Table 31: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.4351 | 0.3152 | 2.20E-03 | -1.77E-01 | 0.4386 | 1.049 | 20001 | 20000 |
| T[1,1] | 0.3391 | 0.1106 | 7.75E-04 | 1.47E-01 | 0.3305 | 0.5702 | 20001 | 20000 |
| T[1,2] | 0.5104 | 0.1786 | 1.78E-03 | 1.71E-01 | 0.5112 | 0.8451 | 20001 | 20000 |
| T[1,3] | 0.5482 | 0.1846 | 1.76E-03 | 1.85E-01 | 0.5544 | 0.8751 | 20001 | 20000 |
| T[2,1] | 0.2843 | 0.1056 | 7.23E-04 | 1.08E-01 | 0.2736 | 0.5103 | 20001 | 20000 |
| T[2,2] | 0.452 | 0.1784 | 1.76E-03 | 1.33E-01 | 0.4449 | 0.8035 | 20001 | 20000 |
| T[2,3] | 0.4903 | 0.1864 | 1.77E-03 | 1.42E-01 | 0.4892 | 0.8421 | 20001 | 20000 |
| T[3,1] | 0.1495 | 0.07901 | 5.43E-04 | 3.62E-02 | 0.1355 | 0.3374 | 20001 | 20000 |
| T[3,2] | 0.2858 | 0.1591 | 1.54E-03 | 5.01E-02 | 0.2619 | 0.6496 | 20001 | 20000 |
| T[3,3] | 0.3207 | 0.172 | 1.60E-03 | 5.59E-02 | 0.2981 | 0.6975 | 20001 | 20000 |
| TP[1,1] | 0.6609 | 0.1106 | 7.75E-04 | 4.30E-01 | 0.6695 | 0.8529 | 20001 | 20000 |
| TP[1,2] | 0.05471 | 0.02717 | 1.87E-04 | 1.48E-02 | 0.05032 | 0.1193 | 20001 | 20000 |
| TP[1,3] | 0.1349 | 0.04654 | 3.19E-04 | 5.60E-02 | 0.1307 | 0.2367 | 20001 | 20000 |
| TP[1,4] | 0.1495 | 0.07901 | 5.43E-04 | 3.62E-02 | 0.1355 | 0.3374 | 20001 | 20000 |
| TP[2,1] | 0.4896 | 0.1786 | 1.78E-03 | 1.55E-01 | 0.4888 | 0.8288 | 20001 | 20000 |
| TP[2,2] | 0.05847 | 0.02987 | 1.92E-04 | 1.51E-02 | 0.05361 | 0.1291 | 20001 | 20000 |
| TP[2,3] | 0.1662 | 0.05548 | 4.41E-04 | 0.06638 | 0.1629 | 0.2842 | 20001 | 20000 |
| TP[2,4] | 0.2858 | 0.1591 | 1.54E-03 | 5.01E-02 | 0.2619 | 0.6496 | 20001 | 20000 |
| TP[3,1] | 0.4518 | 0.1846 | 1.76E-03 | 1.25E-01 | 0.4456 | 0.8157 | 20001 | 20000 |
| TP[3,2] | 0.05788 | 0.02972 | 1.99E-04 | 0.01445 | 0.05315 | 0.128 | 20001 | 20000 |
| TP[3,3] | 0.1697 | 0.05565 | 4.19E-04 | 0.06801 | 0.1668 | 0.2876 | 20001 | 20000 |
| TP[3,4] | 0.3207 | 0.172 | 1.60E-03 | 0.05587 | 0.2981 | 0.6975 | 20001 | 20000 |
| d[2] | -0.4645 | 0.3871 | 0.004404 | -1.232 | -0.4636 | 0.296 | 20001 | 20000 |
| d[3] | -0.5715 | 0.4195 | 0.004423 | -1.399 | -0.5746 | 0.2417 | 20001 | 20000 |
| totresdev | 14.41 | 3.522 | 0.02628 | 9.664 | 13.72 | 22.96 | 20001 | 20000 |
| z[2] | 0.1642 | 0.07984 | 5.19E-04 | 0.04632 | 0.1517 | 0.3529 | 20001 | 20000 |
| z[3] | 0.6656 | 0.1555 | 1.06E-03 | 0.3902 | 0.6563 | 1.001 | 20001 | 20000 |

**Table 32: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.88 | 37.156 | 5.724 | 48.603 |
| total | 42.88 | 37.156 | 5.724 | 48.603 |

### 3.5.4 High Response

**Table 33: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.05782 | 0.2889 | 2.06E-03 | -5.07E-01 | 0.05768 | 0.6254 | 20001 | 20000 |
| T[1,1] | 0.4778 | 0.1107 | 7.88E-04 | 2.66E-01 | 0.477 | 0.6939 | 20001 | 20000 |
| T[1,2] | 0.5832 | 0.1609 | 1.60E-03 | 2.57E-01 | 0.592 | 0.8674 | 20001 | 20000 |
| T[1,3] | 0.3224 | 0.1477 | 1.44E-03 | 8.34E-02 | 0.3062 | 0.6456 | 20001 | 20000 |
| T[2,1] | 0.3985 | 0.1109 | 8.08E-04 | 1.97E-01 | 0.3939 | 0.6242 | 20001 | 20000 |
| T[2,2] | 0.5072 | 0.1657 | 1.65E-03 | 1.90E-01 | 0.5083 | 0.8188 | 20001 | 20000 |
| T[2,3] | 0.2574 | 0.136 | 1.31E-03 | 5.46E-02 | 0.2362 | 0.5705 | 20001 | 20000 |
| T[3,1] | 0.3192 | 0.1059 | 7.56E-04 | 1.36E-01 | 0.3109 | 0.5447 | 20001 | 20000 |
| T[3,2] | 0.4266 | 0.1646 | 1.62E-03 | 1.34E-01 | 0.4202 | 0.7574 | 20001 | 20000 |
| T[3,3] | 0.197 | 0.1201 | 1.14E-03 | 3.33E-02 | 0.1739 | 0.4886 | 20001 | 20000 |
| TP[1,1] | 0.5222 | 0.1107 | 7.88E-04 | 3.06E-01 | 0.523 | 0.7342 | 20001 | 20000 |
| TP[1,2] | 0.07931 | 0.02875 | 2.04E-04 | 3.29E-02 | 0.07592 | 0.1447 | 20001 | 20000 |
| TP[1,3] | 0.07931 | 0.02931 | 2.00E-04 | 3.24E-02 | 0.07601 | 0.1451 | 20001 | 20000 |
| TP[1,4] | 0.3192 | 0.1059 | 7.56E-04 | 1.36E-01 | 0.3109 | 0.5447 | 20001 | 20000 |
| TP[2,1] | 0.4168 | 0.1609 | 1.60E-03 | 1.33E-01 | 0.408 | 0.7433 | 20001 | 20000 |
| TP[2,2] | 0.076 | 0.02949 | 2.10E-04 | 2.89E-02 | 0.07263 | 0.1434 | 20001 | 20000 |
| TP[2,3] | 0.08053 | 0.03086 | 2.06E-04 | 0.03103 | 0.07701 | 0.1506 | 20001 | 20000 |
| TP[2,4] | 0.4266 | 0.1646 | 1.62E-03 | 1.34E-01 | 0.4202 | 0.7574 | 20001 | 20000 |
| TP[3,1] | 0.6776 | 0.1477 | 1.44E-03 | 3.55E-01 | 0.6938 | 0.9168 | 20001 | 20000 |
| TP[3,2] | 0.06499 | 0.02784 | 2.26E-04 | 0.02075 | 0.06153 | 0.1292 | 20001 | 20000 |
| TP[3,3] | 0.06034 | 0.02867 | 2.41E-04 | 0.01602 | 0.0567 | 0.126 | 20001 | 20000 |
| TP[3,4] | 0.197 | 0.1201 | 1.14E-03 | 0.03326 | 0.1739 | 0.4886 | 20001 | 20000 |
| d[2] | -0.2882 | 0.3492 | 0.004016 | -0.9745 | -0.2898 | 0.3935 | 20001 | 20000 |
| d[3] | 0.4468 | 0.344 | 0.003918 | -0.2256 | 0.4502 | 1.112 | 20001 | 20000 |
| totresdev | 12.83 | 3.508 | 0.02845 | 8.076 | 12.17 | 21.46 | 20001 | 20000 |
| z[2] | 0.2106 | 0.07644 | 5.44E-04 | 0.08759 | 0.2018 | 0.3843 | 20001 | 20000 |
| z[3] | 0.434 | 0.1083 | 7.45E-04 | 0.246 | 0.4257 | 0.6659 | 20001 | 20000 |

**Table 34: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 45.255 | 39.464 | 5.791 | 51.045 |
| total | 45.255 | 39.464 | 5.791 | 51.045 |

# 4. Random-effects models

## 4.1 Week 0-2

### 4.1.1 Non-response

**Table 35: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.489 | 0.07554 | 5.99E-04 | 0.3418 | 0.489 | 0.6352 | 20001 | 20000 |
| T[1,1] | 0.3129 | 0.02669 | 2.11E-04 | 0.2627 | 0.3124 | 0.3662 | 20001 | 20000 |
| T[1,2] | 0.5703 | 0.1124 | 9.35E-04 | 0.3263 | 0.5739 | 0.7873 | 20001 | 20000 |
| T[2,1] | 0.1271 | 0.01875 | 1.45E-04 | 0.09324 | 0.1261 | 0.1664 | 20001 | 20000 |
| T[2,2] | 0.326 | 0.1042 | 8.49E-04 | 0.1334 | 0.3193 | 0.5593 | 20001 | 20000 |
| T[3,1] | 0.04189 | 0.009315 | 7.48E-05 | 0.0259 | 0.04114 | 0.06233 | 20001 | 20000 |
| T[3,2] | 0.1542 | 0.0718 | 5.75E-04 | 0.04338 | 0.144 | 0.3314 | 20001 | 20000 |
| TP[1,1] | 0.6871 | 0.02669 | 2.11E-04 | 0.6338 | 0.6876 | 0.7373 | 20001 | 20000 |
| TP[1,2] | 0.1858 | 0.01523 | 1.12E-04 | 0.1565 | 0.1856 | 0.2169 | 20001 | 20000 |
| TP[1,3] | 0.08518 | 0.01229 | 9.10E-05 | 0.0629 | 0.08456 | 0.1113 | 20001 | 20000 |
| TP[1,4] | 0.04189 | 0.009315 | 7.48E-05 | 0.0259 | 0.04114 | 0.06233 | 20001 | 20000 |
| TP[2,1] | 0.4297 | 0.1124 | 9.35E-04 | 0.2127 | 0.4261 | 0.674 | 20001 | 20000 |
| TP[2,2] | 0.2443 | 0.02645 | 1.93E-04 | 0.1832 | 0.2467 | 0.2881 | 20001 | 20000 |
| TP[2,3] | 0.1717 | 0.03866 | 3.15E-04 | 0.0889 | 0.1737 | 0.2436 | 20001 | 20000 |
| TP[2,4] | 0.1542 | 0.0718 | 5.75E-04 | 0.04338 | 0.144 | 0.3314 | 20001 | 20000 |
| d[2] | -0.6735 | 0.2951 | 0.002384 | -1.27 | -0.6768 | -0.06161 | 20001 | 20000 |
| sd | 0.3607 | 0.1675 | 0.001282 | 0.101 | 0.3367 | 0.7498 | 20001 | 20000 |
| totresdev | 13.91 | 3.685 | 0.02763 | 8.84 | 13.22 | 22.91 | 20001 | 20000 |
| z[2] | 0.656 | 0.05015 | 3.49E-04 | 0.5604 | 0.6552 | 0.7562 | 20001 | 20000 |
| z[3] | 1.25 | 0.07229 | 5.72E-04 | 1.113 | 1.248 | 1.395 | 20001 | 20000 |

**Table 36: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 69.739 | 63.712 | 6.026 | 75.765 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 71.125 | 65.099 | 6.026 | 77.152 |

## 4.3 Week 2-4

### 4.3.1 Non response

**Table 37: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.6248 | 0.09418 | 7.06E-04 | 4.41E-01 | 0.6252 | 0.8096 | 20001 | 20000 |
| T[1,1] | 0.2669 | 0.03085 | 2.32E-04 | 2.09E-01 | 0.2659 | 0.3295 | 20001 | 20000 |
| T[1,2] | 0.4535 | 0.09197 | 8.38E-04 | 2.76E-01 | 0.4518 | 0.6443 | 20001 | 20000 |
| T[2,1] | 0.1024 | 0.02107 | 1.59E-04 | 6.52E-02 | 0.101 | 0.1478 | 20001 | 20000 |
| T[2,2] | 0.2269 | 0.07448 | 6.90E-04 | 1.03E-01 | 0.2199 | 0.3958 | 20001 | 20000 |
| T[3,1] | 0.03075 | 0.01022 | 7.88E-05 | 1.44E-02 | 0.02951 | 0.05402 | 20001 | 20000 |
| T[3,2] | 0.09027 | 0.04517 | 4.20E-04 | 2.88E-02 | 0.08273 | 0.1951 | 20001 | 20000 |
| TP[1,1] | 0.7331 | 0.03085 | 2.32E-04 | 6.71E-01 | 0.7341 | 0.7909 | 20001 | 20000 |
| TP[1,2] | 0.1645 | 0.01905 | 1.39E-04 | 1.29E-01 | 0.1639 | 0.2033 | 20001 | 20000 |
| TP[1,3] | 0.07169 | 0.01494 | 1.09E-04 | 4.54E-02 | 0.07067 | 0.1039 | 20001 | 20000 |
| TP[1,4] | 0.03075 | 0.01022 | 7.88E-05 | 1.44E-02 | 0.02951 | 0.05402 | 20001 | 20000 |
| TP[2,1] | 0.5465 | 0.09197 | 8.38E-04 | 3.56E-01 | 0.5482 | 0.7245 | 20001 | 20000 |
| TP[2,2] | 0.2266 | 0.03216 | 2.41E-04 | 1.61E-01 | 0.2273 | 0.2871 | 20001 | 20000 |
| TP[2,3] | 0.1366 | 0.03709 | 3.13E-04 | 6.92E-02 | 0.1342 | 0.2166 | 20001 | 20000 |
| TP[2,4] | 0.09027 | 0.04517 | 4.20E-04 | 2.88E-02 | 0.08273 | 0.1951 | 20001 | 20000 |
| d[2] | -0.505 | 0.224 | 0.002046 | -0.9568 | -0.5027 | -0.06556 | 20001 | 20000 |
| sd | 0.1916 | 0.1613 | 0.001286 | 0.006357 | 0.1499 | 0.5969 | 20001 | 20000 |
| totresdev | 11.34 | 3.274 | 0.02527 | 6.975 | 10.7 | 19.42 | 20001 | 20000 |
| z[2] | 0.6518 | 0.07207 | 5.17E-04 | 5.16E-01 | 0.6495 | 0.7977 | 20001 | 20000 |
| z[3] | 1.265 | 0.113 | 7.93E-04 | 1.05E+00 | 1.262 | 1.496 | 20001 | 20000 |

**Table 38: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 57.153 | 51.765 | 5.388 | 62.541 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 58.539 | 53.151 | 5.388 | 63.927 |

### 4.3.2 Partial response

**Table 39: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.5449 | 0.1852 | 1.45E-03 | -9.11E-01 | -0.5438 | -0.1836 | 20001 | 20000 |
| T[1,1] | 0.7039 | 0.06304 | 4.95E-04 | 5.73E-01 | 0.7067 | 0.819 | 20001 | 20000 |
| T[1,2] | 0.8357 | 0.08009 | 7.68E-04 | 6.46E-01 | 0.8487 | 0.9546 | 20001 | 20000 |
| T[2,1] | 0.2181 | 0.06728 | 5.14E-04 | 1.05E-01 | 0.2122 | 0.3655 | 20001 | 20000 |
| T[2,2] | 0.3829 | 0.1262 | 1.19E-03 | 1.57E-01 | 0.3769 | 0.6466 | 20001 | 20000 |
| T[3,1] | 0.05166 | 0.02771 | 2.13E-04 | 1.41E-02 | 0.04621 | 0.1202 | 20001 | 20000 |
| T[3,2] | 0.13 | 0.0763 | 7.05E-04 | 2.72E-02 | 0.1156 | 0.3162 | 20001 | 20000 |
| TP[1,1] | 0.2961 | 0.06304 | 4.95E-04 | 1.81E-01 | 0.2933 | 0.4272 | 20001 | 20000 |
| TP[1,2] | 0.4858 | 0.0423 | 3.00E-04 | 4.01E-01 | 0.486 | 0.567 | 20001 | 20000 |
| TP[1,3] | 0.1665 | 0.04678 | 3.53E-04 | 8.57E-02 | 0.1631 | 0.2657 | 20001 | 20000 |
| TP[1,4] | 0.05166 | 0.02771 | 2.13E-04 | 1.41E-02 | 0.04621 | 0.1202 | 20001 | 20000 |
| TP[2,1] | 0.1643 | 0.08009 | 7.68E-04 | 4.54E-02 | 0.1514 | 0.3542 | 20001 | 20000 |
| TP[2,2] | 0.4528 | 0.06857 | 5.69E-04 | 2.96E-01 | 0.4599 | 0.5668 | 20001 | 20000 |
| TP[2,3] | 0.2529 | 0.06614 | 5.84E-04 | 1.23E-01 | 0.2538 | 0.3803 | 20001 | 20000 |
| TP[2,4] | 0.13 | 0.0763 | 7.05E-04 | 2.72E-02 | 0.1156 | 0.3162 | 20001 | 20000 |
| d[2] | -0.4841 | 0.2774 | 0.002792 | -1.046 | -0.482 | 0.05961 | 20001 | 20000 |
| sd | 0.2305 | 0.1736 | 0.001524 | 0.009835 | 0.1947 | 0.6448 | 20001 | 20000 |
| totresdev | 7.601 | 3.314 | 0.02518 | 3.092 | 6.941 | 15.68 | 20001 | 20000 |
| z[2] | 1.344 | 0.139 | 9.68E-04 | 1.08E+00 | 1.341 | 1.625 | 20001 | 20000 |
| z[3] | 2.228 | 0.1819 | 1.36E-03 | 1.88E+00 | 2.224 | 2.592 | 20001 | 20000 |

**Table 40: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.604 | 41.173 | 5.431 | 52.034 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 47.99 | 42.56 | 5.431 | 53.421 |

### 4.3.3 Response

**Table 41: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.3041 | 0.3033 | 2.30E-03 | -9.00E-01 | -0.302 | 0.2965 | 20001 | 20000 |
| T[1,1] | 0.6144 | 0.1112 | 8.48E-04 | 3.84E-01 | 0.6187 | 0.8161 | 20001 | 20000 |
| T[1,2] | 0.7683 | 0.129 | 1.61E-03 | 4.63E-01 | 0.7892 | 0.9568 | 20001 | 20000 |
| T[2,1] | 0.3196 | 0.115 | 8.73E-04 | 1.22E-01 | 0.3104 | 0.5659 | 20001 | 20000 |
| T[2,2] | 0.5022 | 0.1702 | 2.16E-03 | 1.77E-01 | 0.5027 | 0.8287 | 20001 | 20000 |
| T[3,1] | 0.1058 | 0.06458 | 4.82E-04 | 2.09E-02 | 0.09217 | 0.2669 | 20001 | 20000 |
| T[3,2] | 0.2283 | 0.1356 | 1.68E-03 | 3.82E-02 | 0.2038 | 0.5577 | 20001 | 20000 |
| TP[1,1] | 0.3856 | 0.1112 | 8.48E-04 | 1.84E-01 | 0.3813 | 0.6166 | 20001 | 20000 |
| TP[1,2] | 0.2949 | 0.05392 | 4.47E-04 | 1.95E-01 | 0.2931 | 0.4052 | 20001 | 20000 |
| TP[1,3] | 0.2138 | 0.06347 | 4.78E-04 | 9.53E-02 | 0.2126 | 0.3413 | 20001 | 20000 |
| TP[1,4] | 0.1058 | 0.06458 | 4.82E-04 | 2.09E-02 | 0.09217 | 0.2669 | 20001 | 20000 |
| TP[2,1] | 0.2317 | 0.129 | 1.61E-03 | 4.33E-02 | 0.2109 | 0.5367 | 20001 | 20000 |
| TP[2,2] | 0.2661 | 0.07079 | 7.37E-04 | 1.19E-01 | 0.2692 | 0.3998 | 20001 | 20000 |
| TP[2,3] | 0.2739 | 0.06742 | 6.39E-04 | 1.30E-01 | 0.277 | 0.3989 | 20001 | 20000 |
| TP[2,4] | 0.2283 | 0.1356 | 1.68E-03 | 3.82E-02 | 0.2038 | 0.5577 | 20001 | 20000 |
| d[2] | -0.5013 | 0.3422 | 0.005189 | -1.179 | -0.5012 | 0.1618 | 20001 | 20000 |
| sd | 0.2227 | 0.1736 | 0.001387 | 0.008543 | 0.1836 | 0.6471 | 20001 | 20000 |
| totresdev | 10.96 | 3.184 | 0.02991 | 6.67 | 10.35 | 18.8 | 20001 | 20000 |
| z[2] | 0.799 | 0.1493 | 1.22E-03 | 5.31E-01 | 0.7911 | 1.117 | 20001 | 20000 |
| z[3] | 1.632 | 0.1916 | 1.47E-03 | 1.27E+00 | 1.627 | 2.016 | 20001 | 20000 |

**Table 42: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 44.552 | 39.355 | 5.197 | 49.748 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 45.938 | 40.742 | 5.197 | 51.135 |

### 4.3.4 High Response

**Table 43: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.287 | 0.4513 | 3.22E-03 | -2.17E+00 | -1.291 | -0.3977 | 20001 | 20000 |
| T[1,1] | 0.8796 | 0.08749 | 6.42E-04 | 6.55E-01 | 0.9016 | 0.9851 | 20001 | 20000 |
| T[1,2] | 0.8891 | 0.1079 | 1.11E-03 | 5.96E-01 | 0.9235 | 0.9951 | 20001 | 20000 |
| T[2,1] | 0.6796 | 0.1644 | 1.28E-03 | 3.12E-01 | 0.7015 | 0.9349 | 20001 | 20000 |
| T[2,2] | 0.7111 | 0.1896 | 2.10E-03 | 2.71E-01 | 0.7469 | 0.9713 | 20001 | 20000 |
| T[3,1] | 0.4814 | 0.1839 | 1.42E-03 | 1.36E-01 | 0.4813 | 0.8304 | 20001 | 20000 |
| T[3,2] | 0.5284 | 0.2175 | 2.41E-03 | 1.14E-01 | 0.5361 | 0.9097 | 20001 | 20000 |
| TP[1,1] | 0.1204 | 0.08749 | 6.42E-04 | 1.49E-02 | 0.09839 | 0.3454 | 20001 | 20000 |
| TP[1,2] | 0.2 | 0.09872 | 7.91E-04 | 4.44E-02 | 0.1885 | 0.4187 | 20001 | 20000 |
| TP[1,3] | 0.1983 | 0.06009 | 4.26E-04 | 8.65E-02 | 0.1962 | 0.3221 | 20001 | 20000 |
| TP[1,4] | 0.4814 | 0.1839 | 1.42E-03 | 1.36E-01 | 0.4813 | 0.8304 | 20001 | 20000 |
| TP[2,1] | 0.1109 | 0.1079 | 1.11E-03 | 4.85E-03 | 0.07648 | 0.4045 | 20001 | 20000 |
| TP[2,2] | 0.178 | 0.1046 | 1.10E-03 | 2.15E-02 | 0.1646 | 0.408 | 20001 | 20000 |
| TP[2,3] | 0.1827 | 0.06612 | 5.53E-04 | 5.44E-02 | 0.1827 | 0.3145 | 20001 | 20000 |
| TP[2,4] | 0.5284 | 0.2175 | 2.41E-03 | 1.14E-01 | 0.5361 | 0.9097 | 20001 | 20000 |
| d[2] | -0.1364 | 0.389 | 0.005227 | -0.8949 | -0.1386 | 0.6341 | 20001 | 20000 |
| sd | 0.2356 | 0.1809 | 0.001572 | 0.008993 | 0.1973 | 0.6758 | 20001 | 20000 |
| totresdev | 13.1 | 3.193 | 0.02965 | 8.762 | 12.46 | 20.95 | 20001 | 20000 |
| z[2] | 0.7647 | 0.2273 | 1.81E-03 | 3.86E-01 | 0.7431 | 1.271 | 20001 | 20000 |
| z[3] | 1.341 | 0.2547 | 2.03E-03 | 8.86E-01 | 1.324 | 1.881 | 20001 | 20000 |

**Table 44: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 38.818 | 33.677 | 5.141 | 43.96 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 40.205 | 35.063 | 5.141 | 45.346 |

## 4.4 Week 4-8

### 4.4.1 Non response

**Table 45: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.6536 | 0.1032 | 7.86E-04 | 4.52E-01 | 0.6542 | 0.856 | 20001 | 20000 |
| T[1,1] | 0.2578 | 0.03319 | 2.53E-04 | 1.96E-01 | 0.2565 | 0.3255 | 20001 | 20000 |
| T[1,2] | 0.4254 | 0.09797 | 8.75E-04 | 2.37E-01 | 0.4226 | 0.6298 | 20001 | 20000 |
| T[2,1] | 0.08006 | 0.02046 | 1.50E-04 | 4.50E-02 | 0.07831 | 0.1247 | 20001 | 20000 |
| T[2,2] | 0.1775 | 0.07043 | 6.03E-04 | 6.55E-02 | 0.1684 | 0.3392 | 20001 | 20000 |
| T[3,1] | 0.03392 | 0.01231 | 8.84E-05 | 1.47E-02 | 0.03225 | 0.06228 | 20001 | 20000 |
| T[3,2] | 0.09045 | 0.04759 | 4.03E-04 | 2.51E-02 | 0.08194 | 0.2036 | 20001 | 20000 |
| TP[1,1] | 0.7422 | 0.03319 | 2.53E-04 | 6.75E-01 | 0.7435 | 0.804 | 20001 | 20000 |
| TP[1,2] | 0.1778 | 0.02257 | 1.66E-04 | 1.36E-01 | 0.1771 | 0.224 | 20001 | 20000 |
| TP[1,3] | 0.04614 | 0.01309 | 9.40E-05 | 2.43E-02 | 0.04484 | 0.07535 | 20001 | 20000 |
| TP[1,4] | 0.03392 | 0.01231 | 8.84E-05 | 1.47E-02 | 0.03225 | 0.06228 | 20001 | 20000 |
| TP[2,1] | 0.5746 | 0.09797 | 8.75E-04 | 3.71E-01 | 0.5774 | 0.7629 | 20001 | 20000 |
| TP[2,2] | 0.2479 | 0.04181 | 3.55E-04 | 1.62E-01 | 0.2487 | 0.3259 | 20001 | 20000 |
| TP[2,3] | 0.08704 | 0.03126 | 2.48E-04 | 3.52E-02 | 0.08359 | 0.1574 | 20001 | 20000 |
| TP[2,4] | 0.09045 | 0.04759 | 4.03E-04 | 2.51E-02 | 0.08194 | 0.2036 | 20001 | 20000 |
| d[2] | -0.4593 | 0.2399 | 0.002188 | -0.9377 | -0.4575 | 0.01742 | 20001 | 20000 |
| sd | 0.2014 | 0.1632 | 0.001266 | 0.007295 | 0.1631 | 0.6007 | 20001 | 20000 |
| totresdev | 7.333 | 3.267 | 0.02592 | 2.929 | 6.696 | 15.36 | 20001 | 20000 |
| z[2] | 0.7645 | 0.0925 | 6.39E-04 | 5.93E-01 | 0.7619 | 0.9549 | 20001 | 20000 |
| z[3] | 1.197 | 0.1283 | 9.53E-04 | 9.57E-01 | 1.193 | 1.458 | 20001 | 20000 |

**Table 46: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 48.841 | 43.485 | 5.356 | 54.197 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 50.227 | 44.871 | 5.356 | 55.583 |

### 4.4.2 Partial response

**Table 47: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6862 | 0.1828 | 1.42E-03 | -1.04E+00 | -0.686 | -0.3287 | 20001 | 20000 |
| T[1,1] | 0.7502 | 0.05728 | 4.45E-04 | 6.29E-01 | 0.7536 | 0.8512 | 20001 | 20000 |
| T[1,2] | 0.8137 | 0.08533 | 7.82E-04 | 6.15E-01 | 0.8257 | 0.9453 | 20001 | 20000 |
| T[2,1] | 0.3032 | 0.07495 | 5.98E-04 | 1.69E-01 | 0.2993 | 0.4606 | 20001 | 20000 |
| T[2,2] | 0.3973 | 0.1261 | 1.19E-03 | 1.70E-01 | 0.3915 | 0.6601 | 20001 | 20000 |
| T[3,1] | 0.1298 | 0.04904 | 3.83E-04 | 5.25E-02 | 0.1236 | 0.2434 | 20001 | 20000 |
| T[3,2] | 0.1966 | 0.09563 | 8.71E-04 | 5.44E-02 | 0.1819 | 0.4229 | 20001 | 20000 |
| TP[1,1] | 0.2498 | 0.05728 | 4.45E-04 | 1.49E-01 | 0.2464 | 0.3712 | 20001 | 20000 |
| TP[1,2] | 0.447 | 0.04213 | 3.25E-04 | 3.62E-01 | 0.4481 | 0.5264 | 20001 | 20000 |
| TP[1,3] | 0.1734 | 0.03827 | 2.99E-04 | 1.04E-01 | 0.1719 | 0.2524 | 20001 | 20000 |
| TP[1,4] | 0.1298 | 0.04904 | 3.83E-04 | 5.25E-02 | 0.1236 | 0.2434 | 20001 | 20000 |
| TP[2,1] | 0.1863 | 0.08533 | 7.82E-04 | 5.47E-02 | 0.1743 | 0.3854 | 20001 | 20000 |
| TP[2,2] | 0.4164 | 0.06179 | 5.45E-04 | 2.75E-01 | 0.4232 | 0.5183 | 20001 | 20000 |
| TP[2,3] | 0.2007 | 0.04779 | 4.15E-04 | 1.05E-01 | 0.2016 | 0.2922 | 20001 | 20000 |
| TP[2,4] | 0.1966 | 0.09563 | 8.71E-04 | 5.44E-02 | 0.1819 | 0.4229 | 20001 | 20000 |
| d[2] | -0.2524 | 0.2766 | 0.002927 | -0.8155 | -0.2513 | 0.3032 | 20001 | 20000 |
| sd | 0.2432 | 0.1768 | 0.001577 | 0.01094 | 0.2107 | 0.6627 | 20001 | 20000 |
| totresdev | 12.15 | 3.338 | 0.02787 | 7.44 | 11.55 | 20.18 | 20001 | 20000 |
| z[2] | 1.214 | 0.1193 | 9.14E-04 | 9.86E-01 | 1.212 | 1.453 | 20001 | 20000 |
| z[3] | 1.844 | 0.1459 | 1.09E-03 | 1.57E+00 | 1.841 | 2.139 | 20001 | 20000 |

**Table 48: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 53.482 | 47.973 | 5.51 | 58.992 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 54.869 | 49.359 | 5.51 | 60.378 |

### 4.4.3 Response

**Table 49: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.236 | 0.3158 | 2.29E-03 | -1.86E+00 | -1.236 | -0.6208 | 20001 | 20000 |
| T[1,1] | 0.8806 | 0.06181 | 4.68E-04 | 7.33E-01 | 0.8917 | 0.9683 | 20001 | 20000 |
| T[1,2] | 0.8816 | 0.08529 | 8.14E-04 | 6.65E-01 | 0.9013 | 0.9848 | 20001 | 20000 |
| T[2,1] | 0.667 | 0.1206 | 9.11E-04 | 4.12E-01 | 0.6765 | 0.8753 | 20001 | 20000 |
| T[2,2] | 0.6797 | 0.1522 | 1.52E-03 | 3.47E-01 | 0.6958 | 0.9249 | 20001 | 20000 |
| T[3,1] | 0.328 | 0.1247 | 9.13E-04 | 1.17E-01 | 0.3184 | 0.5973 | 20001 | 20000 |
| T[3,2] | 0.3531 | 0.1602 | 1.58E-03 | 8.74E-02 | 0.3371 | 0.702 | 20001 | 20000 |
| TP[1,1] | 0.1194 | 0.06181 | 4.68E-04 | 3.18E-02 | 0.1083 | 0.2674 | 20001 | 20000 |
| TP[1,2] | 0.2137 | 0.07147 | 5.52E-04 | 8.55E-02 | 0.2093 | 0.3636 | 20001 | 20000 |
| TP[1,3] | 0.339 | 0.05157 | 3.94E-04 | 2.37E-01 | 0.3393 | 0.439 | 20001 | 20000 |
| TP[1,4] | 0.328 | 0.1247 | 9.13E-04 | 1.17E-01 | 0.3184 | 0.5973 | 20001 | 20000 |
| TP[2,1] | 0.1184 | 0.08529 | 8.14E-04 | 1.52E-02 | 0.09873 | 0.3353 | 20001 | 20000 |
| TP[2,2] | 0.2019 | 0.08084 | 7.81E-04 | 5.73E-02 | 0.1993 | 0.3649 | 20001 | 20000 |
| TP[2,3] | 0.3265 | 0.05997 | 4.84E-04 | 1.95E-01 | 0.3296 | 0.4359 | 20001 | 20000 |
| TP[2,4] | 0.3531 | 0.1602 | 1.58E-03 | 8.74E-02 | 0.3371 | 0.702 | 20001 | 20000 |
| d[2] | -0.05701 | 0.3072 | 0.003771 | -0.6698 | -0.05665 | 0.5429 | 20001 | 20000 |
| sd | 0.2341 | 0.1772 | 0.001676 | 0.008822 | 0.1979 | 0.6656 | 20001 | 20000 |
| totresdev | 14.04 | 3.231 | 0.02662 | 9.637 | 13.42 | 22 | 20001 | 20000 |
| z[2] | 0.7783 | 0.1497 | 1.19E-03 | 5.08E-01 | 0.7702 | 1.098 | 20001 | 20000 |
| z[3] | 1.71 | 0.1848 | 1.55E-03 | 1.36E+00 | 1.704 | 2.086 | 20001 | 20000 |

**Table 50: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 49.791 | 44.468 | 5.323 | 55.114 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 51.177 | 45.854 | 5.323 | 56.5 |

### 4.4.5 High Response

**Table 51: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -1.068 | 0.3325 | 2.63E-03 | -1.72E+00 | -1.065 | -0.4097 | 20001 | 20000 |
| T[1,1] | 0.8447 | 0.07736 | 6.03E-04 | 6.59E-01 | 0.8565 | 0.9573 | 20001 | 20000 |
| T[1,2] | 0.9276 | 0.0711 | 7.53E-04 | 7.36E-01 | 0.9497 | 0.9957 | 20001 | 20000 |
| T[2,1] | 0.654 | 0.1295 | 1.03E-03 | 3.77E-01 | 0.6637 | 0.8738 | 20001 | 20000 |
| T[2,2] | 0.8095 | 0.1336 | 1.48E-03 | 4.75E-01 | 0.8396 | 0.9781 | 20001 | 20000 |
| T[3,1] | 0.5412 | 0.1413 | 1.11E-03 | 2.62E-01 | 0.5451 | 0.8038 | 20001 | 20000 |
| T[3,2] | 0.7256 | 0.1607 | 1.78E-03 | 3.45E-01 | 0.7532 | 0.9562 | 20001 | 20000 |
| TP[1,1] | 0.1553 | 0.07736 | 6.03E-04 | 4.27E-02 | 0.1435 | 0.341 | 20001 | 20000 |
| TP[1,2] | 0.1906 | 0.07113 | 5.55E-04 | 7.05E-02 | 0.1851 | 0.3436 | 20001 | 20000 |
| TP[1,3] | 0.1129 | 0.03873 | 2.71E-04 | 4.85E-02 | 0.1088 | 0.1989 | 20001 | 20000 |
| TP[1,4] | 0.5412 | 0.1413 | 1.11E-03 | 2.62E-01 | 0.5451 | 0.8038 | 20001 | 20000 |
| TP[2,1] | 0.07237 | 0.0711 | 7.53E-04 | 4.31E-03 | 0.05032 | 0.2645 | 20001 | 20000 |
| TP[2,2] | 0.1181 | 0.07307 | 7.87E-04 | 1.64E-02 | 0.1053 | 0.2894 | 20001 | 20000 |
| TP[2,3] | 0.08393 | 0.04131 | 3.67E-04 | 1.81E-02 | 0.07898 | 0.176 | 20001 | 20000 |
| TP[2,4] | 0.7256 | 0.1607 | 1.78E-03 | 3.45E-01 | 0.7532 | 0.9562 | 20001 | 20000 |
| d[2] | -0.567 | 0.3828 | 0.004668 | -1.31 | -0.5723 | 0.2307 | 20001 | 20000 |
| sd | 0.3101 | 0.2015 | 0.002167 | 0.01578 | 0.2873 | 0.7543 | 20001 | 20000 |
| totresdev | 11.18 | 3.62 | 0.03314 | 5.703 | 10.67 | 19.65 | 20001 | 20000 |
| z[2] | 0.646 | 0.1655 | 1.26E-03 | 3.56E-01 | 0.635 | 1.001 | 20001 | 20000 |
| z[3] | 0.9581 | 0.184 | 1.46E-03 | 6.23E-01 | 0.9491 | 1.347 | 20001 | 20000 |

**Table 52: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 40.718 | 35.252 | 5.466 | 46.183 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 42.104 | 36.638 | 5.466 | 47.569 |

## 4.5 Week 8-12

### 4.5.1 Non response

**Table 53: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.7078 | 0.1117 | 8.23E-04 | 4.88E-01 | 0.7091 | 0.9267 | 20001 | 20000 |
| T[1,1] | 0.2409 | 0.03466 | 2.55E-04 | 1.77E-01 | 0.2392 | 0.3129 | 20001 | 20000 |
| T[1,2] | 0.2283 | 0.08754 | 7.79E-04 | 8.67E-02 | 0.2178 | 0.4298 | 20001 | 20000 |
| T[2,1] | 0.09652 | 0.02491 | 1.79E-04 | 5.44E-02 | 0.09451 | 0.1506 | 20001 | 20000 |
| T[2,2] | 0.09325 | 0.05327 | 4.64E-04 | 2.27E-02 | 0.08299 | 0.2247 | 20001 | 20000 |
| T[3,1] | 0.03924 | 0.01531 | 1.15E-04 | 1.53E-02 | 0.03729 | 0.07486 | 20001 | 20000 |
| T[3,2] | 0.03895 | 0.02999 | 2.43E-04 | 6.10E-03 | 0.03177 | 0.1162 | 20001 | 20000 |
| TP[1,1] | 0.7591 | 0.03466 | 2.55E-04 | 6.87E-01 | 0.7609 | 0.823 | 20001 | 20000 |
| TP[1,2] | 0.1444 | 0.02237 | 1.57E-04 | 1.04E-01 | 0.1433 | 0.1916 | 20001 | 20000 |
| TP[1,3] | 0.05728 | 0.0167 | 1.18E-04 | 2.95E-02 | 0.05559 | 0.09413 | 20001 | 20000 |
| TP[1,4] | 0.03924 | 0.01531 | 1.15E-04 | 1.53E-02 | 0.03729 | 0.07486 | 20001 | 20000 |
| TP[2,1] | 0.7717 | 0.08754 | 7.79E-04 | 5.70E-01 | 0.7822 | 0.9135 | 20001 | 20000 |
| TP[2,2] | 0.135 | 0.04118 | 3.52E-04 | 6.03E-02 | 0.1326 | 0.2222 | 20001 | 20000 |
| TP[2,3] | 0.0543 | 0.02779 | 2.47E-04 | 1.45E-02 | 0.04931 | 0.1209 | 20001 | 20000 |
| TP[2,4] | 0.03895 | 0.02999 | 2.43E-04 | 6.10E-03 | 0.03177 | 0.1162 | 20001 | 20000 |
| d[2] | 0.06867 | 0.2776 | 0.002573 | -0.4994 | 0.07277 | 0.604 | 20001 | 20000 |
| sd | 0.2324 | 0.1774 | 0.001609 | 0.009543 | 0.1954 | 0.6635 | 20001 | 20000 |
| totresdev | 9.818 | 3.271 | 0.02451 | 5.275 | 9.219 | 17.87 | 20001 | 20000 |
| z[2] | 0.6078 | 0.09493 | 6.47E-04 | 4.37E-01 | 0.6022 | 0.8072 | 20001 | 20000 |

**Table 54: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.429 | 41.047 | 5.381 | 51.81 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 47.815 | 42.434 | 5.381 | 53.196 |

### 4.5.2 Partial response

**Table 55: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.5102 | 0.1538 | 1.17E-03 | -8.14E-01 | -0.5096 | -0.2072 | 20001 | 20000 |
| T[1,1] | 0.693 | 0.05344 | 4.08E-04 | 5.82E-01 | 0.6949 | 0.7922 | 20001 | 20000 |
| T[1,2] | 0.7439 | 0.09181 | 8.64E-04 | 5.39E-01 | 0.7526 | 0.8971 | 20001 | 20000 |
| T[2,1] | 0.2818 | 0.06372 | 4.42E-04 | 1.66E-01 | 0.2787 | 0.4151 | 20001 | 20000 |
| T[2,2] | 0.3458 | 0.1096 | 1.02E-03 | 1.50E-01 | 0.3386 | 0.5786 | 20001 | 20000 |
| T[3,1] | 0.1029 | 0.03775 | 2.72E-04 | 4.34E-02 | 0.0979 | 0.19 | 20001 | 20000 |
| T[3,2] | 0.1431 | 0.07204 | 6.63E-04 | 3.95E-02 | 0.1314 | 0.3133 | 20001 | 20000 |
| TP[1,1] | 0.307 | 0.05344 | 4.08E-04 | 2.08E-01 | 0.3052 | 0.4179 | 20001 | 20000 |
| TP[1,2] | 0.4112 | 0.03837 | 2.96E-04 | 3.36E-01 | 0.411 | 0.4863 | 20001 | 20000 |
| TP[1,3] | 0.1789 | 0.03776 | 2.72E-04 | 1.10E-01 | 0.1771 | 0.2581 | 20001 | 20000 |
| TP[1,4] | 0.1029 | 0.03775 | 2.72E-04 | 4.34E-02 | 0.0979 | 0.19 | 20001 | 20000 |
| TP[2,1] | 0.2561 | 0.09181 | 8.64E-04 | 1.03E-01 | 0.2474 | 0.4611 | 20001 | 20000 |
| TP[2,2] | 0.3981 | 0.04782 | 3.85E-04 | 2.96E-01 | 0.4003 | 0.4846 | 20001 | 20000 |
| TP[2,3] | 0.2027 | 0.05101 | 4.35E-04 | 1.04E-01 | 0.2025 | 0.3033 | 20001 | 20000 |
| TP[2,4] | 0.1431 | 0.07204 | 6.63E-04 | 3.95E-02 | 0.1314 | 0.3133 | 20001 | 20000 |
| d[2] | -0.1728 | 0.2534 | 0.002431 | -0.6756 | -0.1715 | 0.3307 | 20001 | 20000 |
| sd | 0.2072 | 0.1666 | 0.001551 | 0.007572 | 0.1683 | 0.6234 | 20001 | 20000 |
| totresdev | 13.26 | 3.229 | 0.02529 | 8.898 | 12.63 | 21.17 | 20001 | 20000 |
| z[2] | 1.098 | 0.1142 | 8.77E-04 | 8.85E-01 | 1.095 | 1.331 | 20001 | 20000 |
| z[3] | 1.804 | 0.1471 | 1.15E-03 | 1.52E+00 | 1.801 | 2.099 | 20001 | 20000 |

**Table 56: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 55.568 | 50.187 | 5.381 | 60.949 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 56.954 | 51.574 | 5.381 | 62.335 |

### 4.5.3 Response

**Table 57: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.8393 | 0.2897 | 2.30E-03 | -1.41E+00 | -0.8397 | -0.2707 | 20001 | 20000 |
| T[1,1] | 0.7899 | 0.08111 | 6.34E-04 | 6.07E-01 | 0.7995 | 0.9203 | 20001 | 20000 |
| T[1,2] | 0.835 | 0.1036 | 1.11E-03 | 5.77E-01 | 0.8556 | 0.9719 | 20001 | 20000 |
| T[2,1] | 0.6522 | 0.1109 | 8.85E-04 | 4.17E-01 | 0.6593 | 0.8462 | 20001 | 20000 |
| T[2,2] | 0.7181 | 0.141 | 1.59E-03 | 3.92E-01 | 0.7374 | 0.9351 | 20001 | 20000 |
| T[3,1] | 0.2882 | 0.1104 | 8.88E-04 | 1.05E-01 | 0.2779 | 0.5282 | 20001 | 20000 |
| T[3,2] | 0.3697 | 0.1597 | 1.82E-03 | 9.66E-02 | 0.3587 | 0.7057 | 20001 | 20000 |
| TP[1,1] | 0.2101 | 0.08111 | 6.34E-04 | 7.97E-02 | 0.2005 | 0.3933 | 20001 | 20000 |
| TP[1,2] | 0.1378 | 0.04863 | 3.83E-04 | 5.65E-02 | 0.1323 | 0.2463 | 20001 | 20000 |
| TP[1,3] | 0.364 | 0.05335 | 3.66E-04 | 2.59E-01 | 0.3639 | 0.4686 | 20001 | 20000 |
| TP[1,4] | 0.2882 | 0.1104 | 8.88E-04 | 1.05E-01 | 0.2779 | 0.5282 | 20001 | 20000 |
| TP[2,1] | 0.165 | 0.1036 | 1.11E-03 | 2.81E-02 | 0.1444 | 0.4231 | 20001 | 20000 |
| TP[2,2] | 0.1169 | 0.0522 | 5.48E-04 | 3.12E-02 | 0.1111 | 0.2331 | 20001 | 20000 |
| TP[2,3] | 0.3485 | 0.06503 | 5.14E-04 | 2.08E-01 | 0.352 | 0.4657 | 20001 | 20000 |
| TP[2,4] | 0.3697 | 0.1597 | 1.82E-03 | 9.66E-02 | 0.3587 | 0.7057 | 20001 | 20000 |
| d[2] | -0.2228 | 0.3287 | 0.004234 | -0.8723 | -0.224 | 0.4255 | 20001 | 20000 |
| sd | 0.2493 | 0.184 | 0.00183 | 0.01092 | 0.2143 | 0.682 | 20001 | 20000 |
| totresdev | 7.767 | 3.255 | 0.03001 | 3.185 | 7.19 | 15.72 | 20001 | 20000 |
| z[2] | 0.4294 | 0.1203 | 9.17E-04 | 2.24E-01 | 0.4184 | 0.6926 | 20001 | 20000 |
| z[3] | 1.429 | 0.1761 | 1.18E-03 | 1.10E+00 | 1.425 | 1.787 | 20001 | 20000 |

**Table 58: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.297 | 37.006 | 5.291 | 47.588 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 43.683 | 38.392 | 5.291 | 48.975 |

### 4.5.4 High Response

**Table 59: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.9684 | 0.2517 | 1.81E-03 | -1.46E+00 | -0.9679 | -0.4758 | 20001 | 20000 |
| T[1,1] | 0.8262 | 0.0635 | 4.56E-04 | 6.83E-01 | 0.8335 | 0.9281 | 20001 | 20000 |
| T[1,2] | 0.9172 | 0.05843 | 6.51E-04 | 7.66E-01 | 0.9311 | 0.988 | 20001 | 20000 |
| T[2,1] | 0.659 | 0.09949 | 7.49E-04 | 4.48E-01 | 0.6653 | 0.8326 | 20001 | 20000 |
| T[2,2] | 0.8092 | 0.1036 | 1.18E-03 | 5.57E-01 | 0.8268 | 0.9584 | 20001 | 20000 |
| T[3,1] | 0.4139 | 0.1098 | 8.05E-04 | 2.11E-01 | 0.4101 | 0.633 | 20001 | 20000 |
| T[3,2] | 0.6057 | 0.1447 | 1.59E-03 | 3.02E-01 | 0.6141 | 0.8603 | 20001 | 20000 |
| TP[1,1] | 0.1738 | 0.0635 | 4.56E-04 | 7.19E-02 | 0.1665 | 0.3171 | 20001 | 20000 |
| TP[1,2] | 0.1671 | 0.05202 | 3.93E-04 | 7.88E-02 | 0.1633 | 0.2811 | 20001 | 20000 |
| TP[1,3] | 0.2451 | 0.04198 | 2.84E-04 | 1.67E-01 | 0.2439 | 0.3306 | 20001 | 20000 |
| TP[1,4] | 0.4139 | 0.1098 | 8.05E-04 | 2.11E-01 | 0.4101 | 0.633 | 20001 | 20000 |
| TP[2,1] | 0.08282 | 0.05843 | 6.51E-04 | 1.20E-02 | 0.06893 | 0.2345 | 20001 | 20000 |
| TP[2,2] | 0.108 | 0.05305 | 5.70E-04 | 2.69E-02 | 0.1006 | 0.2302 | 20001 | 20000 |
| TP[2,3] | 0.2035 | 0.05647 | 4.95E-04 | 9.06E-02 | 0.2053 | 0.3098 | 20001 | 20000 |
| TP[2,4] | 0.6057 | 0.1447 | 1.59E-03 | 3.02E-01 | 0.6141 | 0.8603 | 20001 | 20000 |
| d[2] | -0.5164 | 0.2899 | 0.00371 | -1.097 | -0.5148 | 0.05233 | 20001 | 20000 |
| sd | 0.2109 | 0.1671 | 0.001463 | 0.008121 | 0.1721 | 0.6292 | 20001 | 20000 |
| totresdev | 10.06 | 3.192 | 0.02727 | 5.768 | 9.419 | 18.03 | 20001 | 20000 |
| z[2] | 0.5429 | 0.1255 | 8.89E-04 | 3.22E-01 | 0.5358 | 0.8123 | 20001 | 20000 |
| z[3] | 1.195 | 0.1541 | 1.09E-03 | 9.10E-01 | 1.191 | 1.511 | 20001 | 20000 |

**Table 60: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.555 | 41.319 | 5.235 | 51.79 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 47.941 | 42.706 | 5.235 | 53.177 |

## 4.6 Week 12-36

### 4.6.1 Non response

**Table 61: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 1.457 | 0.2477 | 0.00176 | 0.9764 | 1.457 | 1.948 | 20001 | 20000 |
| T[1,1] | 0.07862 | 0.03617 | 2.60E-04 | 0.02569 | 0.07259 | 0.1645 | 20001 | 20000 |
| T[1,2] | 0.2841 | 0.1616 | 0.002449 | 0.04562 | 0.2592 | 0.6579 | 20001 | 20000 |
| T[1,3] | 0.3749 | 0.1727 | 0.002488 | 0.08536 | 0.3599 | 0.7472 | 20001 | 20000 |
| T[2,1] | 0.03412 | 0.02081 | 1.46E-04 | 0.007465 | 0.02937 | 0.08718 | 20001 | 20000 |
| T[2,2] | 0.1712 | 0.1279 | 0.001845 | 0.0167 | 0.1402 | 0.4982 | 20001 | 20000 |
| T[2,3] | 0.2412 | 0.1474 | 0.002038 | 0.03485 | 0.2141 | 0.5945 | 20001 | 20000 |
| T[3,1] | 0.01549 | 0.01192 | 8.65E-05 | 0.002223 | 0.01232 | 0.0467 | 20001 | 20000 |
| T[3,2] | 0.1039 | 0.09698 | 0.001313 | 0.005946 | 0.07505 | 0.3694 | 20001 | 20000 |
| T[3,3] | 0.1545 | 0.1187 | 0.001576 | 0.01403 | 0.1246 | 0.4611 | 20001 | 20000 |
| TP[1,1] | 0.9214 | 0.03617 | 2.60E-04 | 0.8356 | 0.9274 | 0.9743 | 20001 | 20000 |
| TP[1,2] | 0.0445 | 0.01967 | 1.42E-04 | 0.01553 | 0.04135 | 0.0916 | 20001 | 20000 |
| TP[1,3] | 0.01863 | 0.01146 | 7.87E-05 | 0.004113 | 0.01608 | 0.04761 | 20001 | 20000 |
| TP[1,4] | 0.01549 | 0.01192 | 8.65E-05 | 0.002223 | 0.01232 | 0.0467 | 20001 | 20000 |
| TP[2,1] | 0.7159 | 0.1616 | 0.002449 | 0.3423 | 0.7408 | 0.9544 | 20001 | 20000 |
| TP[2,2] | 0.1129 | 0.05032 | 6.69E-04 | 0.02625 | 0.1102 | 0.219 | 20001 | 20000 |
| TP[2,3] | 0.0673 | 0.04292 | 5.78E-04 | 0.008697 | 0.05945 | 0.1695 | 20001 | 20000 |
| TP[2,4] | 0.1039 | 0.09698 | 0.001313 | 0.005946 | 0.07505 | 0.3694 | 20001 | 20000 |
| TP[3,1] | 0.6251 | 0.1727 | 0.002488 | 0.253 | 0.6402 | 0.9148 | 20001 | 20000 |
| TP[3,2] | 0.1337 | 0.04929 | 5.44E-04 | 0.04368 | 0.1314 | 0.2376 | 20001 | 20000 |
| TP[3,3] | 0.08674 | 0.04627 | 5.36E-04 | 0.01676 | 0.07989 | 0.1942 | 20001 | 20000 |
| TP[3,4] | 0.1545 | 0.1187 | 0.001576 | 0.01403 | 0.1246 | 0.4611 | 20001 | 20000 |
| d[2] | -0.8123 | 0.4714 | 0.007932 | -1.761 | -0.813 | 0.1202 | 20001 | 20000 |
| d[3] | -1.1 | 0.452 | 0.006981 | -2.005 | -1.1 | -0.2065 | 20001 | 20000 |
| sd | 0.228 | 0.1746 | 0.001647 | 0.01121 | 0.1891 | 0.6479 | 20001 | 20000 |
| totresdev | 14.38 | 3.51 | 0.03006 | 9.567 | 13.71 | 22.78 | 20001 | 20000 |
| z[2] | 0.4327 | 0.1168 | 7.73E-04 | 0.2326 | 0.4231 | 0.6871 | 20001 | 20000 |
| z[3] | 0.7927 | 0.1662 | 0.00111 | 0.5013 | 0.782 | 1.149 | 20001 | 20000 |

**Table 62: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 46.551 | 40.521 | 6.031 | 52.582 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| Total | 47.937 | 41.907 | 6.031 | 53.968 |

### 4.6.2 Partial response

**Table 63: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.4073 | 0.2312 | 0.001578 | -0.04628 | 0.4054 | 0.8665 | 20001 | 20000 |
| T[1,1] | 0.3457 | 0.08316 | 5.67E-04 | 0.1932 | 0.3426 | 0.5185 | 20001 | 20000 |
| T[1,2] | 0.7662 | 0.1485 | 0.00204 | 0.4118 | 0.7955 | 0.9685 | 20001 | 20000 |
| T[1,3] | 0.2928 | 0.1688 | 0.002176 | 0.04003 | 0.2684 | 0.6717 | 20001 | 20000 |
| T[2,1] | 0.1694 | 0.06743 | 4.81E-04 | 0.06165 | 0.161 | 0.3219 | 20001 | 20000 |
| T[2,2] | 0.5831 | 0.1832 | 0.002414 | 0.2069 | 0.5956 | 0.899 | 20001 | 20000 |
| T[2,3] | 0.1471 | 0.1217 | 0.001512 | 0.008829 | 0.114 | 0.4611 | 20001 | 20000 |
| T[3,1] | 0.07382 | 0.04205 | 3.19E-04 | 0.01701 | 0.06556 | 0.177 | 20001 | 20000 |
| T[3,2] | 0.4007 | 0.1823 | 0.002223 | 0.08839 | 0.3888 | 0.7765 | 20001 | 20000 |
| T[3,3] | 0.068 | 0.07622 | 8.74E-04 | 0.001703 | 0.04231 | 0.2769 | 20001 | 20000 |
| TP[1,1] | 0.6543 | 0.08316 | 5.67E-04 | 0.4815 | 0.6574 | 0.8069 | 20001 | 20000 |
| TP[1,2] | 0.1763 | 0.04561 | 3.61E-04 | 0.09628 | 0.1733 | 0.2736 | 20001 | 20000 |
| TP[1,3] | 0.09559 | 0.03783 | 2.75E-04 | 0.03533 | 0.09089 | 0.1833 | 20001 | 20000 |
| TP[1,4] | 0.07382 | 0.04205 | 3.19E-04 | 0.01701 | 0.06556 | 0.177 | 20001 | 20000 |
| TP[2,1] | 0.2338 | 0.1485 | 0.00204 | 0.03169 | 0.2045 | 0.5882 | 20001 | 20000 |
| TP[2,2] | 0.1831 | 0.06528 | 6.42E-04 | 0.05951 | 0.1814 | 0.3176 | 20001 | 20000 |
| TP[2,3] | 0.1824 | 0.06053 | 5.51E-04 | 0.07445 | 0.1783 | 0.31 | 20001 | 20000 |
| TP[2,4] | 0.4007 | 0.1823 | 0.002223 | 0.08839 | 0.3888 | 0.7765 | 20001 | 20000 |
| TP[3,1] | 0.7072 | 0.1688 | 0.002176 | 0.3284 | 0.7316 | 0.96 | 20001 | 20000 |
| TP[3,2] | 0.1456 | 0.0667 | 7.85E-04 | 0.02862 | 0.1425 | 0.2843 | 20001 | 20000 |
| TP[3,3] | 0.07912 | 0.05522 | 6.92E-04 | 0.006446 | 0.06753 | 0.2131 | 20001 | 20000 |
| TP[3,4] | 0.068 | 0.07622 | 8.74E-04 | 0.001703 | 0.04231 | 0.2769 | 20001 | 20000 |
| d[2] | -1.228 | 0.4807 | 0.006891 | -2.161 | -1.224 | -0.2801 | 20001 | 20000 |
| d[3] | 0.2174 | 0.5092 | 0.007272 | -0.7585 | 0.2117 | 1.237 | 20001 | 20000 |
| sd | 0.2363 | 0.1805 | 0.001798 | 0.01034 | 0.1984 | 0.6801 | 20001 | 20000 |
| totresdev | 19.85 | 3.488 | 0.03763 | 15.04 | 19.2 | 28.37 | 20001 | 20000 |
| z[2] | 0.5846 | 0.1498 | 1.29E-03 | 0.3215 | 0.5739 | 0.9057 | 20001 | 20000 |
| z[3] | 1.106 | 0.2013 | 0.001838 | 0.7447 | 1.096 | 1.528 | 20001 | 20000 |

**Table 64: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 47.939 | 41.851 | 6.088 | 54.027 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 49.326 | 43.238 | 6.088 | 55.414 |

### 4.6.3 Response

**Table 65: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.4305 | 0.318 | 0.002035 | -0.1902 | 0.4321 | 1.056 | 20001 | 20000 |
| T[1,1] | 0.3408 | 0.1115 | 7.25E-04 | 0.1458 | 0.3329 | 0.5755 | 20001 | 20000 |
| T[1,2] | 0.5173 | 0.1994 | 0.002882 | 0.1413 | 0.5209 | 0.8844 | 20001 | 20000 |
| T[1,3] | 0.5498 | 0.2033 | 0.003031 | 0.1554 | 0.5576 | 0.9094 | 20001 | 20000 |
| T[2,1] | 0.2861 | 0.1063 | 7.12E-04 | 0.1085 | 0.2766 | 0.5164 | 20001 | 20000 |
| T[2,2] | 0.4607 | 0.1996 | 0.002855 | 0.1069 | 0.4543 | 0.8493 | 20001 | 20000 |
| T[2,3] | 0.4938 | 0.2056 | 0.003047 | 0.1186 | 0.4935 | 0.8797 | 20001 | 20000 |
| T[3,1] | 0.1502 | 0.07925 | 5.33E-04 | 0.03645 | 0.1371 | 0.3371 | 20001 | 20000 |
| T[3,2] | 0.2973 | 0.1797 | 0.002492 | 0.03888 | 0.269 | 0.709 | 20001 | 20000 |
| T[3,3] | 0.3278 | 0.1911 | 2.73E-03 | 0.04383 | 0.3005 | 0.7539 | 20001 | 20000 |
| TP[1,1] | 0.6592 | 0.1115 | 7.25E-04 | 0.4246 | 0.6672 | 0.8545 | 20001 | 20000 |
| TP[1,2] | 0.05477 | 0.02725 | 1.99E-04 | 0.01462 | 0.05051 | 0.1187 | 20001 | 20000 |
| TP[1,3] | 0.1359 | 0.04667 | 3.31E-04 | 0.0574 | 0.1318 | 0.237 | 20001 | 20000 |
| TP[1,4] | 0.1502 | 0.07925 | 5.33E-04 | 0.03645 | 0.1371 | 0.3371 | 20001 | 20000 |
| TP[2,1] | 0.4827 | 0.1994 | 0.002882 | 0.1157 | 0.4791 | 0.8588 | 20001 | 20000 |
| TP[2,2] | 0.05661 | 0.02967 | 2.33E-04 | 0.01289 | 0.05183 | 0.1266 | 20001 | 20000 |
| TP[2,3] | 0.1634 | 0.05798 | 5.76E-04 | 0.05605 | 0.1608 | 0.2852 | 20001 | 20000 |
| TP[2,4] | 0.2973 | 0.1797 | 0.002492 | 0.03888 | 0.269 | 0.709 | 20001 | 20000 |
| TP[3,1] | 0.4502 | 0.2033 | 0.003031 | 0.0908 | 0.4425 | 0.8446 | 20001 | 20000 |
| TP[3,2] | 0.05604 | 0.02963 | 2.36E-04 | 0.01278 | 0.05121 | 0.126 | 20001 | 20000 |
| TP[3,3] | 0.166 | 0.05792 | 5.79E-04 | 0.05916 | 0.163 | 0.2867 | 20001 | 20000 |
| TP[3,4] | 0.3278 | 0.1911 | 2.73E-03 | 0.04383 | 0.3005 | 0.7539 | 20001 | 20000 |
| d[2] | -0.4812 | 0.482 | 0.008173 | -1.446 | -0.4759 | 0.4518 | 20001 | 20000 |
| d[3] | -0.5768 | 0.5044 | 0.008738 | -1.586 | -0.5714 | 0.4042 | 20001 | 20000 |
| sd | 0.2356 | 0.1812 | 0.001856 | 0.007975 | 0.198 | 0.6731 | 20001 | 20000 |
| totresdev | 14.45 | 3.512 | 0.03689 | 9.552 | 13.8 | 23.05 | 20001 | 20000 |
| z[2] | 0.1639 | 0.0796 | 5.93E-04 | 0.0448 | 0.1519 | 0.3527 | 20001 | 20000 |
| z[3] | 0.6676 | 0.1554 | 0.001078 | 0.3959 | 0.6574 | 0.9986 | 20001 | 20000 |

**Table 66: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.92 | 36.98 | 5.939 | 48.859 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 44.306 | 38.367 | 5.939 | 50.245 |

### 4.6.4 High Response

**Table 67: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.05599 | 0.2882 | 0.001916 | -0.5111 | 0.05339 | 0.6217 | 20001 | 20000 |
| T[1,1] | 0.4786 | 0.1103 | 7.35E-04 | 0.2673 | 0.4787 | 0.6954 | 20001 | 20000 |
| T[1,2] | 0.5811 | 0.1879 | 0.002495 | 0.1984 | 0.5901 | 0.9086 | 20001 | 20000 |
| T[1,3] | 0.3204 | 0.1719 | 0.002108 | 0.05305 | 0.2989 | 0.7064 | 20001 | 20000 |
| T[2,1] | 0.3991 | 0.1104 | 7.60E-04 | 0.1953 | 0.3954 | 0.6232 | 20001 | 20000 |
| T[2,2] | 0.5076 | 0.1928 | 0.002562 | 0.1419 | 0.5064 | 0.8708 | 20001 | 20000 |
| T[2,3] | 0.2577 | 0.1586 | 0.00193 | 0.03253 | 0.2298 | 0.6332 | 20001 | 20000 |
| T[3,1] | 0.3198 | 0.1052 | 7.09E-04 | 0.1358 | 0.3133 | 0.5454 | 20001 | 20000 |
| T[3,2] | 0.4303 | 0.1919 | 0.002527 | 0.09566 | 0.4186 | 0.8191 | 20001 | 20000 |
| T[3,3] | 0.1994 | 0.1413 | 1.69E-03 | 0.01901 | 0.1683 | 0.5506 | 20001 | 20000 |
| TP[1,1] | 0.5214 | 0.1103 | 7.35E-04 | 0.3046 | 0.5213 | 0.7329 | 20001 | 20000 |
| TP[1,2] | 0.07954 | 0.02899 | 2.08E-04 | 0.03201 | 0.07629 | 0.1448 | 20001 | 20000 |
| TP[1,3] | 0.07927 | 0.02931 | 2.09E-04 | 0.03231 | 0.07577 | 0.1457 | 20001 | 20000 |
| TP[1,4] | 0.3198 | 0.1052 | 7.09E-04 | 0.1358 | 0.3133 | 0.5454 | 20001 | 20000 |
| TP[2,1] | 0.4189 | 0.1879 | 0.002495 | 0.09158 | 0.4099 | 0.8017 | 20001 | 20000 |
| TP[2,2] | 0.07342 | 0.03034 | 2.34E-04 | 0.02379 | 0.07006 | 0.1413 | 20001 | 20000 |
| TP[2,3] | 0.07737 | 0.03125 | 2.27E-04 | 0.02596 | 0.07393 | 0.1474 | 20001 | 20000 |
| TP[2,4] | 0.4303 | 0.1919 | 0.002527 | 0.09566 | 0.4186 | 0.8191 | 20001 | 20000 |
| TP[3,1] | 0.6796 | 0.1719 | 0.002108 | 0.2937 | 0.7011 | 0.947 | 20001 | 20000 |
| TP[3,2] | 0.06272 | 0.02933 | 2.62E-04 | 0.01563 | 0.05945 | 0.1287 | 20001 | 20000 |
| TP[3,3] | 0.05826 | 0.03016 | 3.08E-04 | 0.01107 | 0.05453 | 0.1267 | 20001 | 20000 |
| TP[3,4] | 0.1994 | 0.1413 | 1.69E-03 | 0.01901 | 0.1683 | 0.5506 | 20001 | 20000 |
| d[2] | -0.2899 | 0.467 | 0.006874 | -1.233 | -0.285 | 0.6094 | 20001 | 20000 |
| d[3] | 0.4747 | 0.4602 | 0.006133 | -0.433 | 0.4749 | 1.382 | 20001 | 20000 |
| sd | 0.2615 | 0.191 | 0.002015 | 0.01063 | 0.2278 | 0.7104 | 20001 | 20000 |
| totresdev | 12.39 | 3.66 | 0.03122 | 7.11 | 11.74 | 21.32 | 20001 | 20000 |
| z[2] | 0.2111 | 0.07704 | 5.67E-04 | 0.08511 | 0.2022 | 0.3836 | 20001 | 20000 |
| z[3] | 0.4341 | 0.1076 | 6.75E-04 | 0.2459 | 0.4267 | 0.6632 | 20001 | 20000 |

**Table 68: DIC**

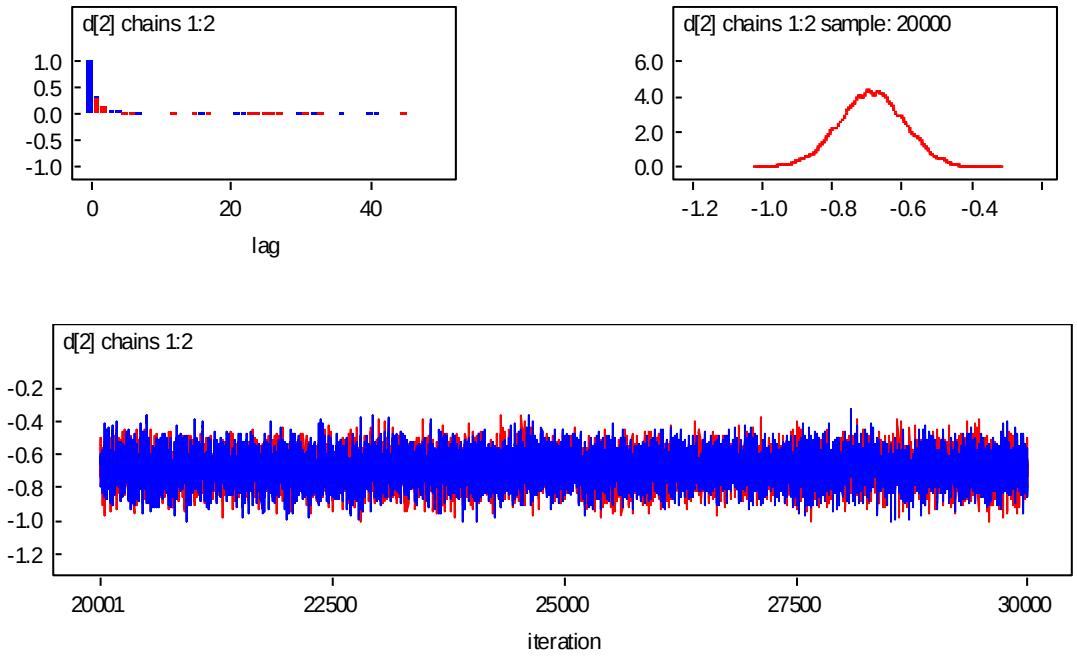
| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 44.807 | 38.628 | 6.18 | 50.987 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 46.194 | 40.014 | 6.18 | 52.374 |

# 5. Appendix A1 - Fixed-effect models

## 5.1 Week 0-2

### 5.1.1 Non-response

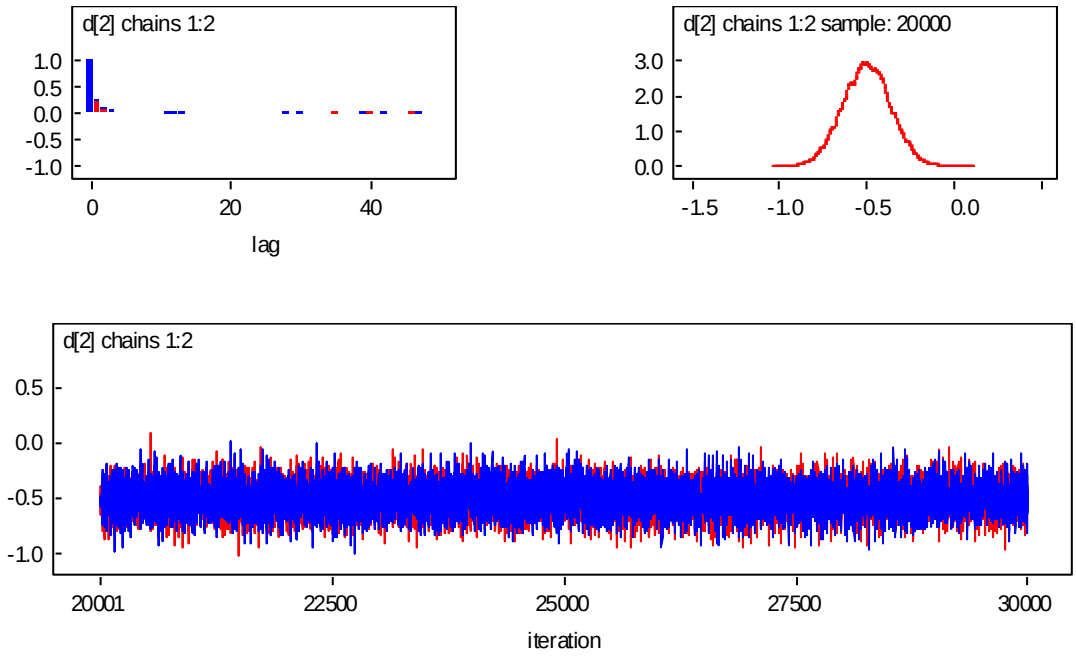
**Figure A1: Convergence, autocorrelation and density plots**



## 5.2 Week 2-4

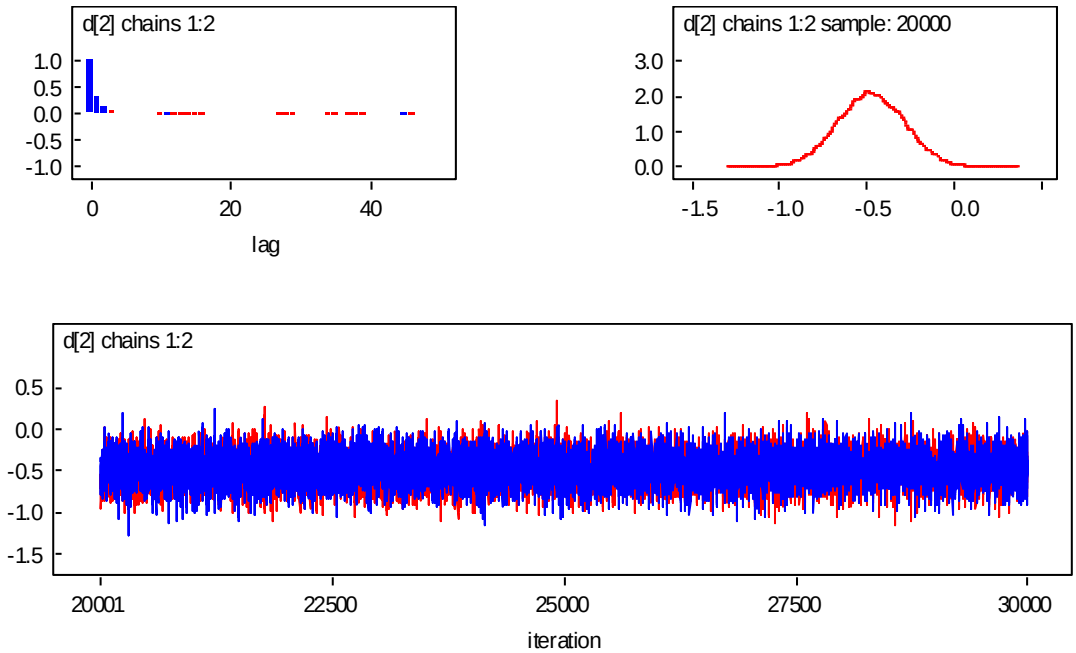
### 5.2.1 Non response

**Figure A2: Convergence, autocorrelation and density plots**



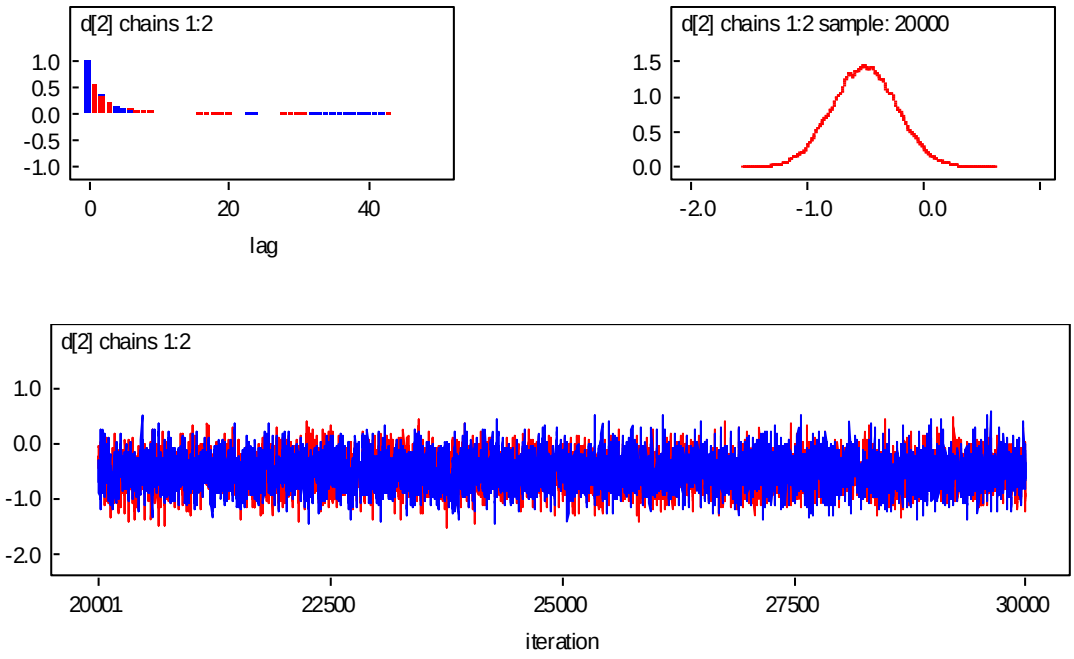

### 5.2.2 Partial response

**Figure A3: Convergence, autocorrelation and density plots**



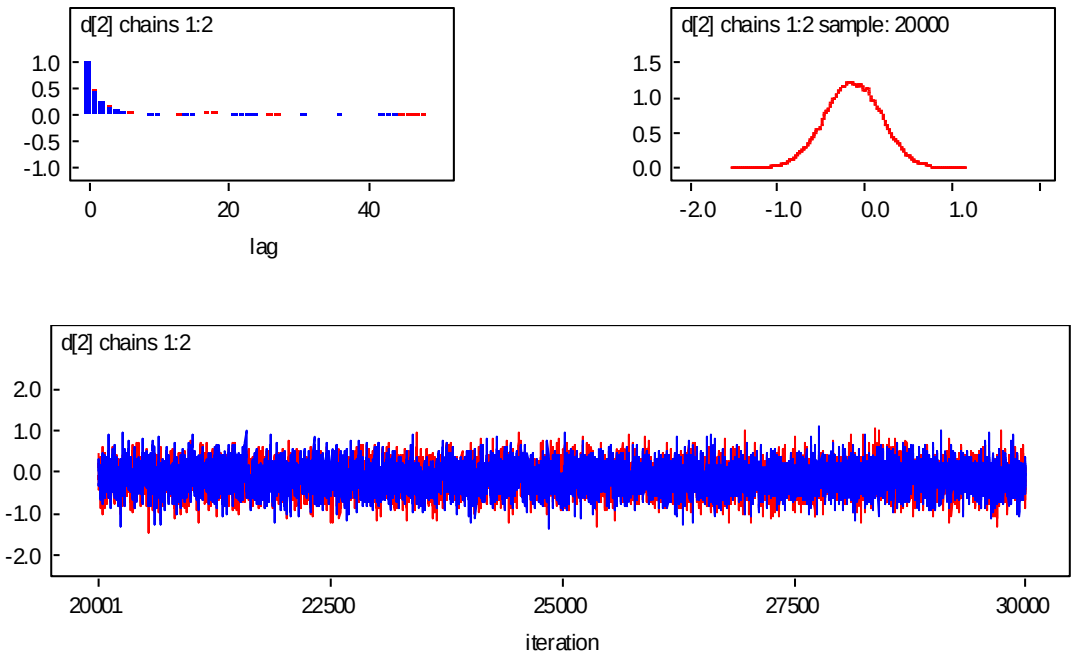
### 5.2.3 Response

**Figure A4: Convergence, autocorrelation and density plots**




### 5.2.4 High Response

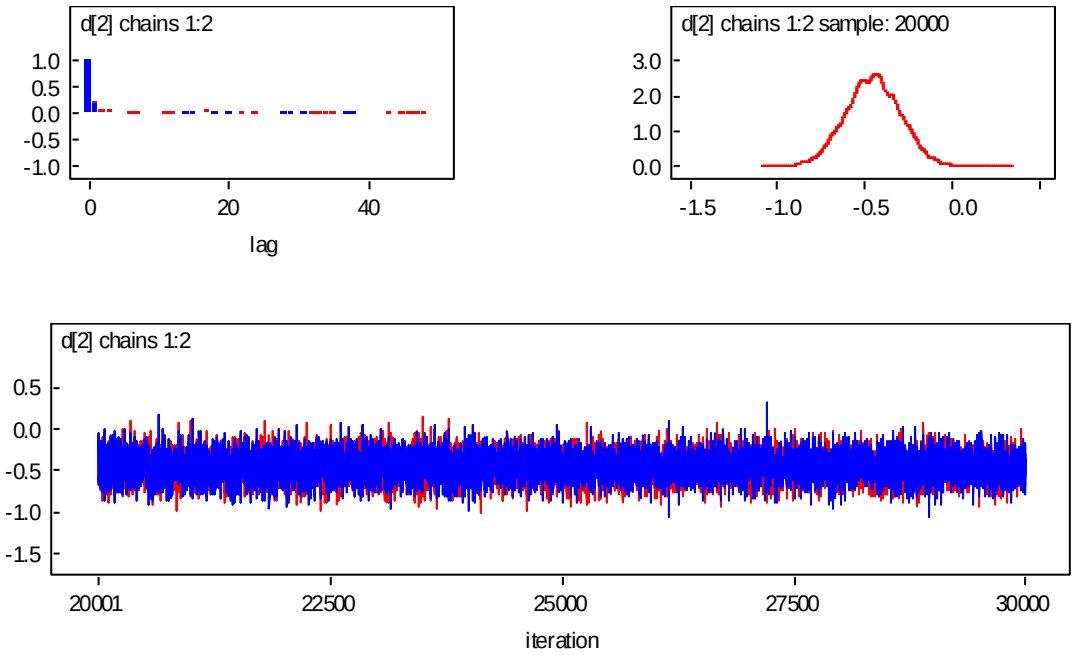
**Figure A5: Convergence, autocorrelation and density plots**



## 5.3 Week 4-8

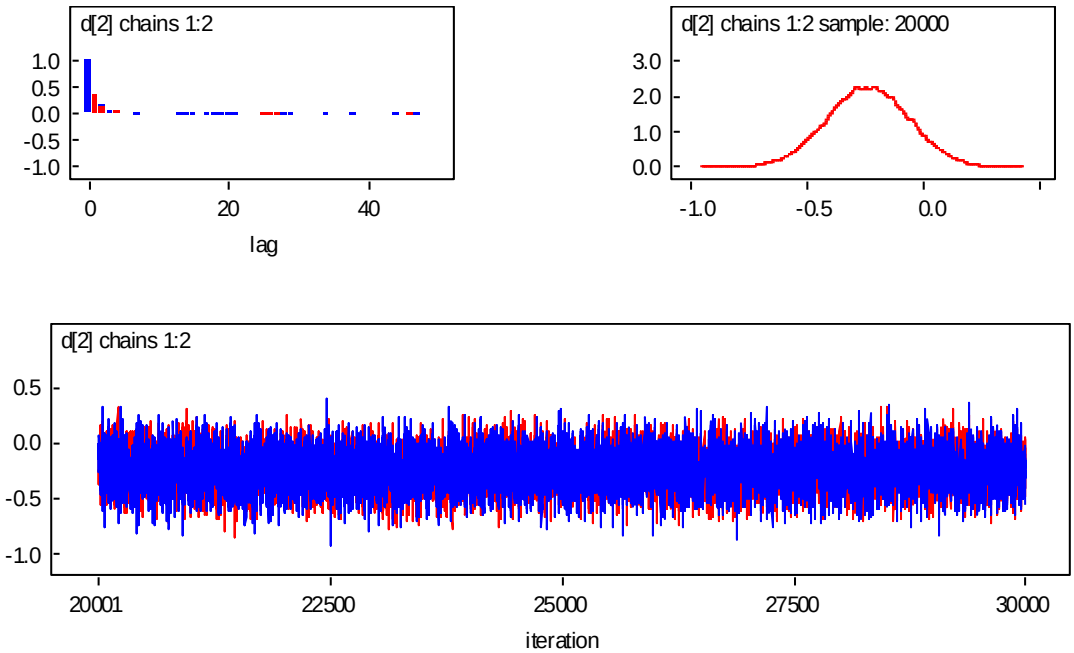
### 5.3.1 Non response

**Figure A6: Convergence, autocorrelation and density plots**



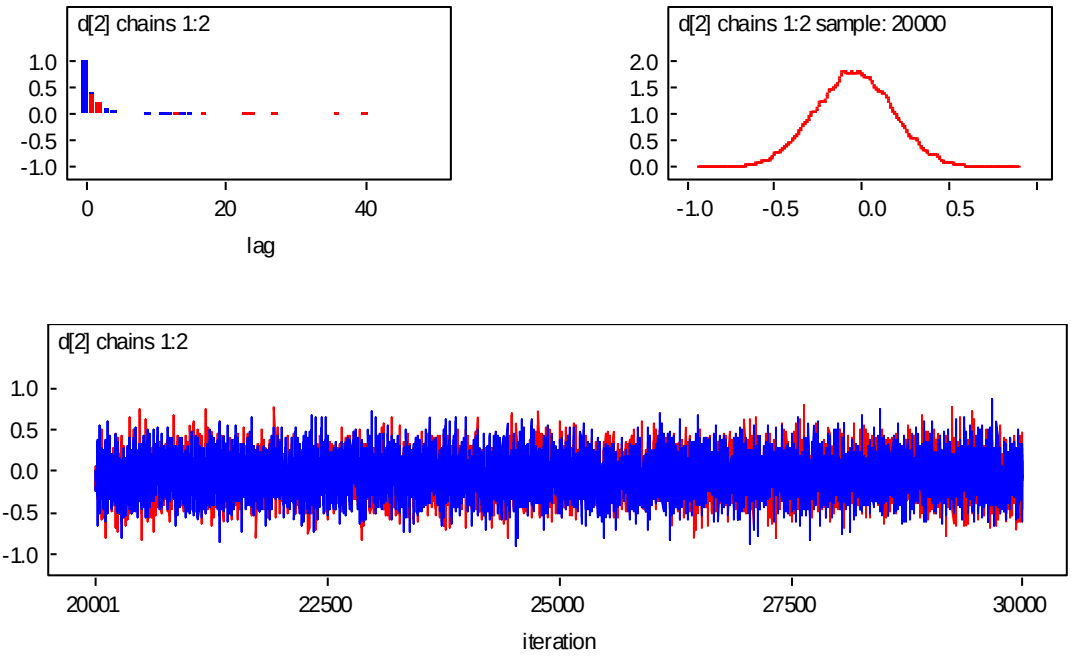

### 5.3.2 Partial response

**Figure A7: Convergence, autocorrelation and density plots**



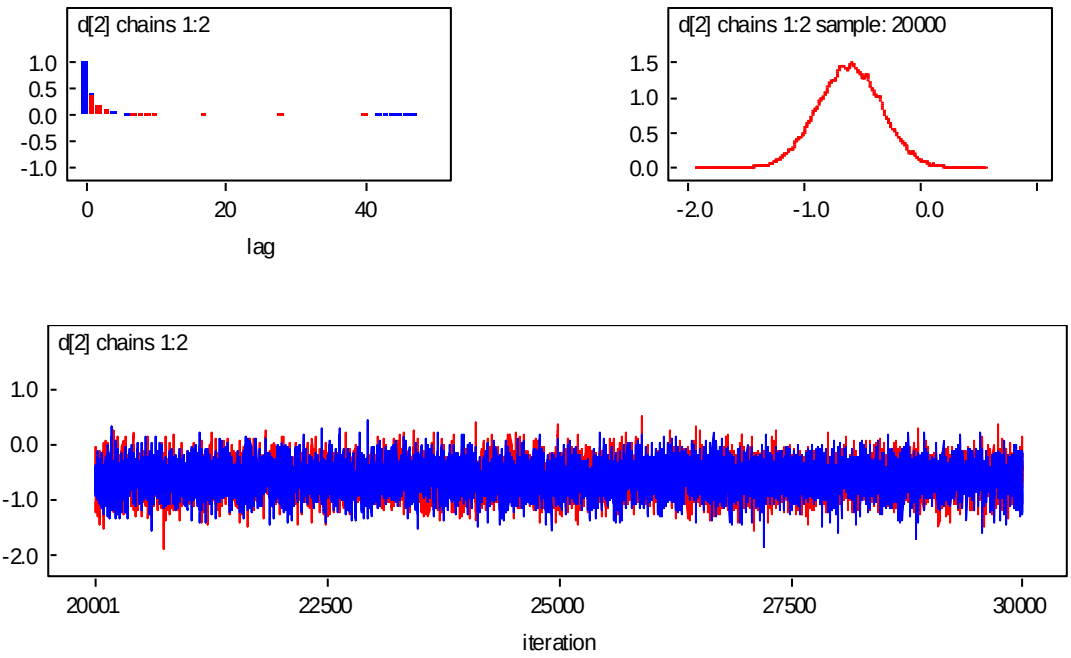
### 5.3.3 Response

**Figure A8: Convergence, autocorrelation and density plots**




### 5.3.4 High Response

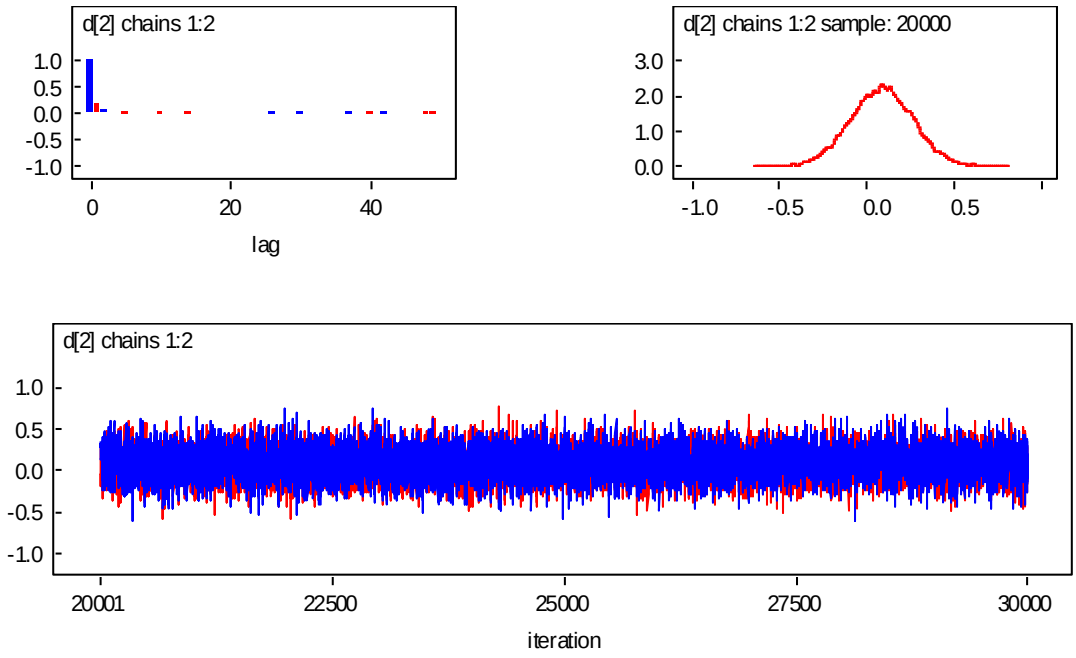
**Figure A9: Convergence, autocorrelation and density plots**



## 5.4 Week 8-12

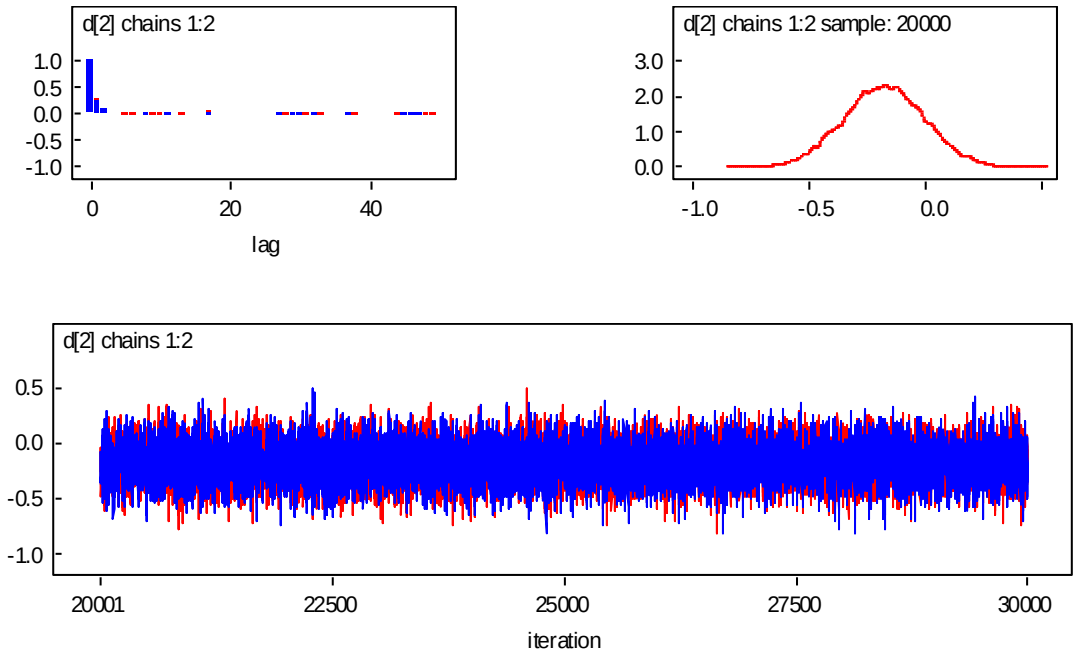
### 5.4.1 Non response

**Figure A10: Convergence, autocorrelation and density plots**



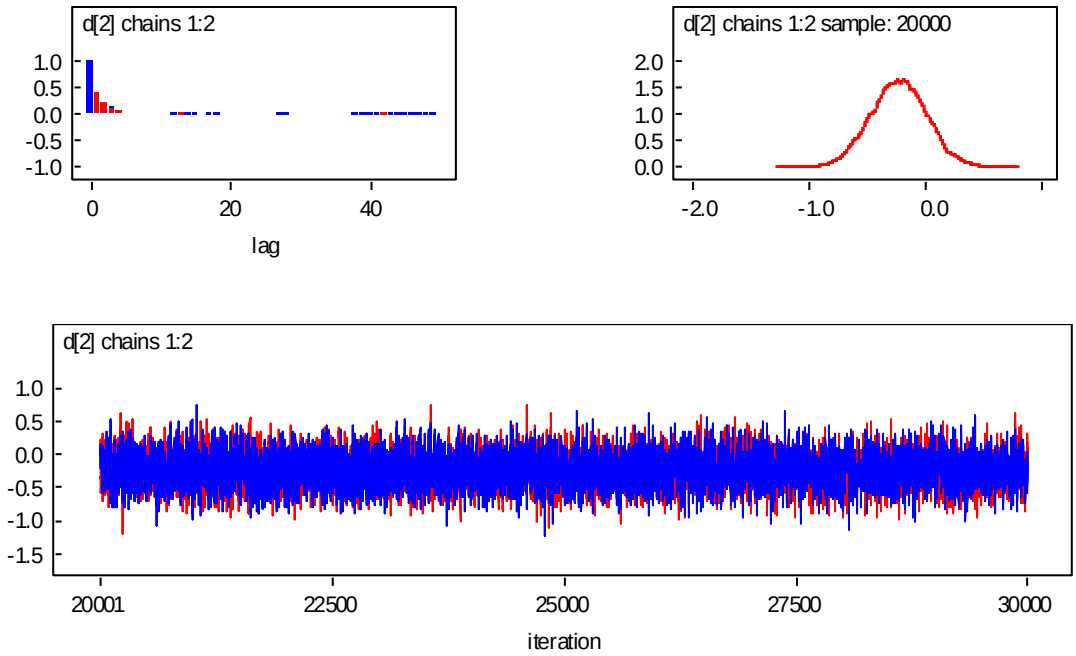

### 5.4.2 Partial response

**Figure A11: Convergence, autocorrelation and density plots**



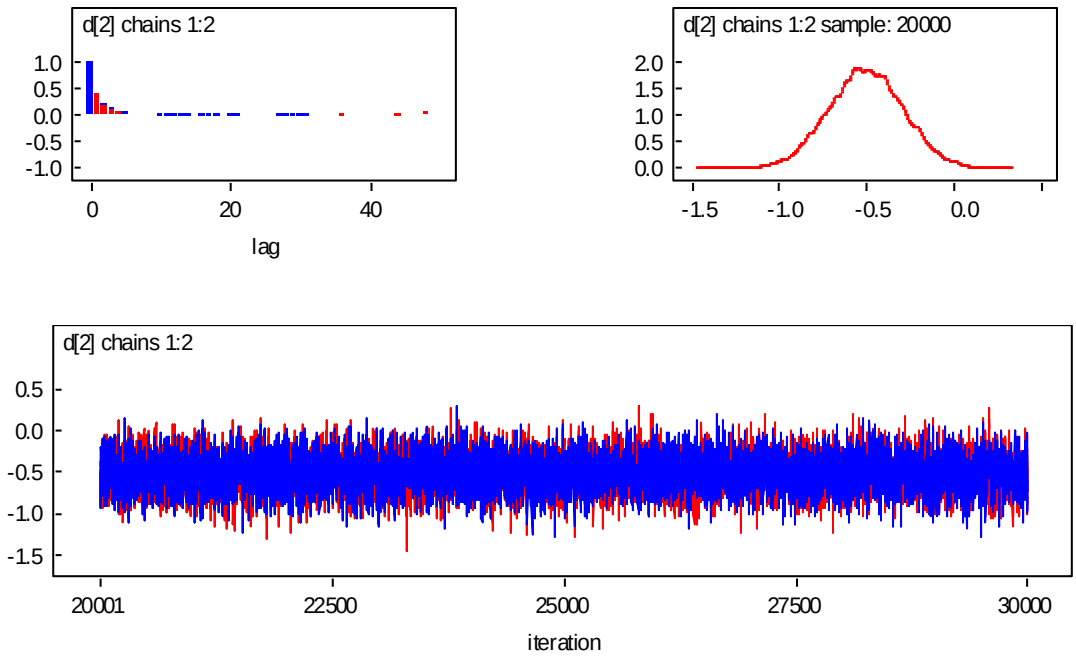
### 5.4.3 Response

**Figure A12: Convergence, autocorrelation and density plots**




### 5.4.4 High Response

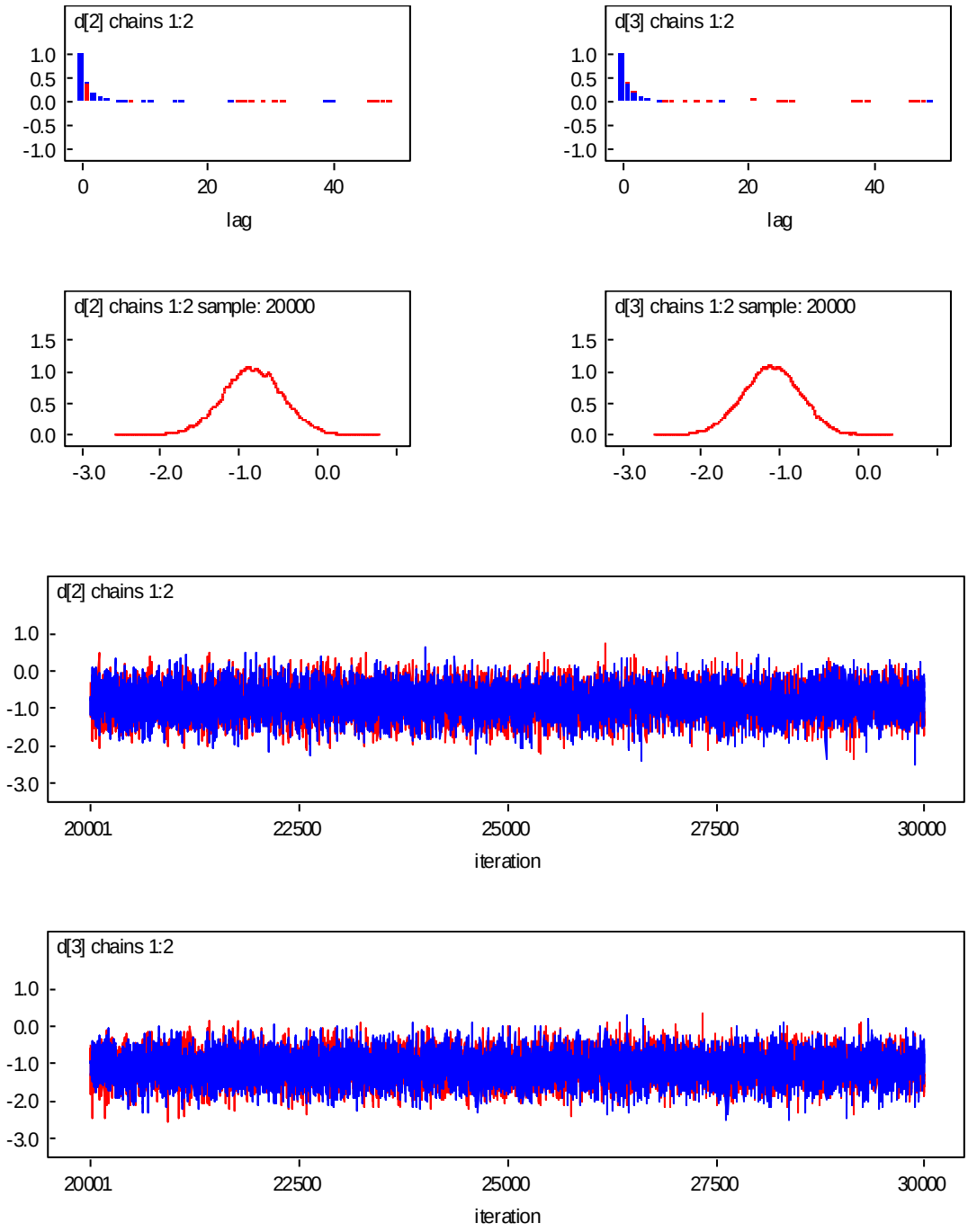
**Figure A13: Convergence, autocorrelation and density plots**



## 5.5 Week 12-36

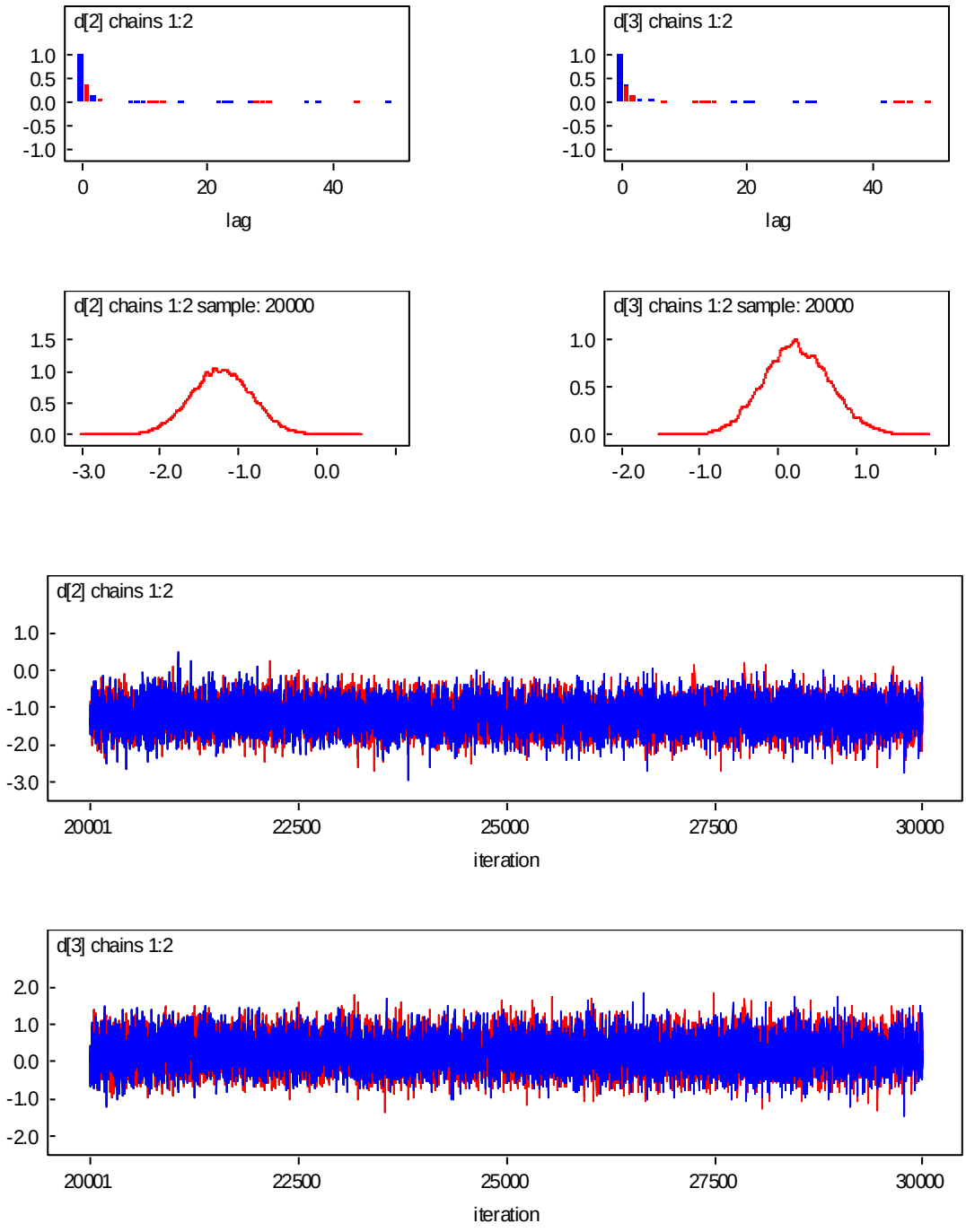
### 5.5.1 Non response

**Figure A14: Convergence, autocorrelation and density plots**



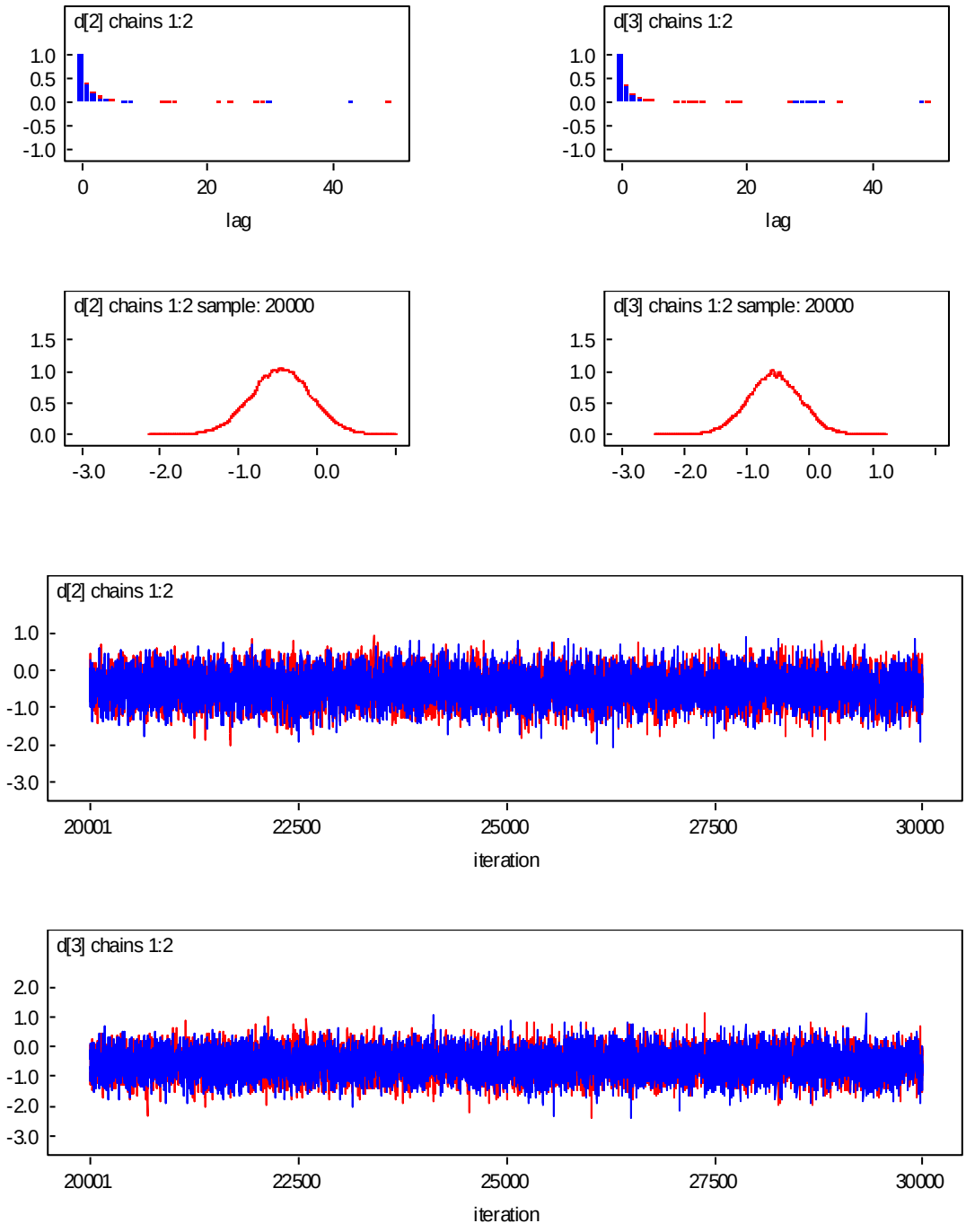
### 5.5.2 Partial response

**Figure A15: Convergence, autocorrelation and density plots**



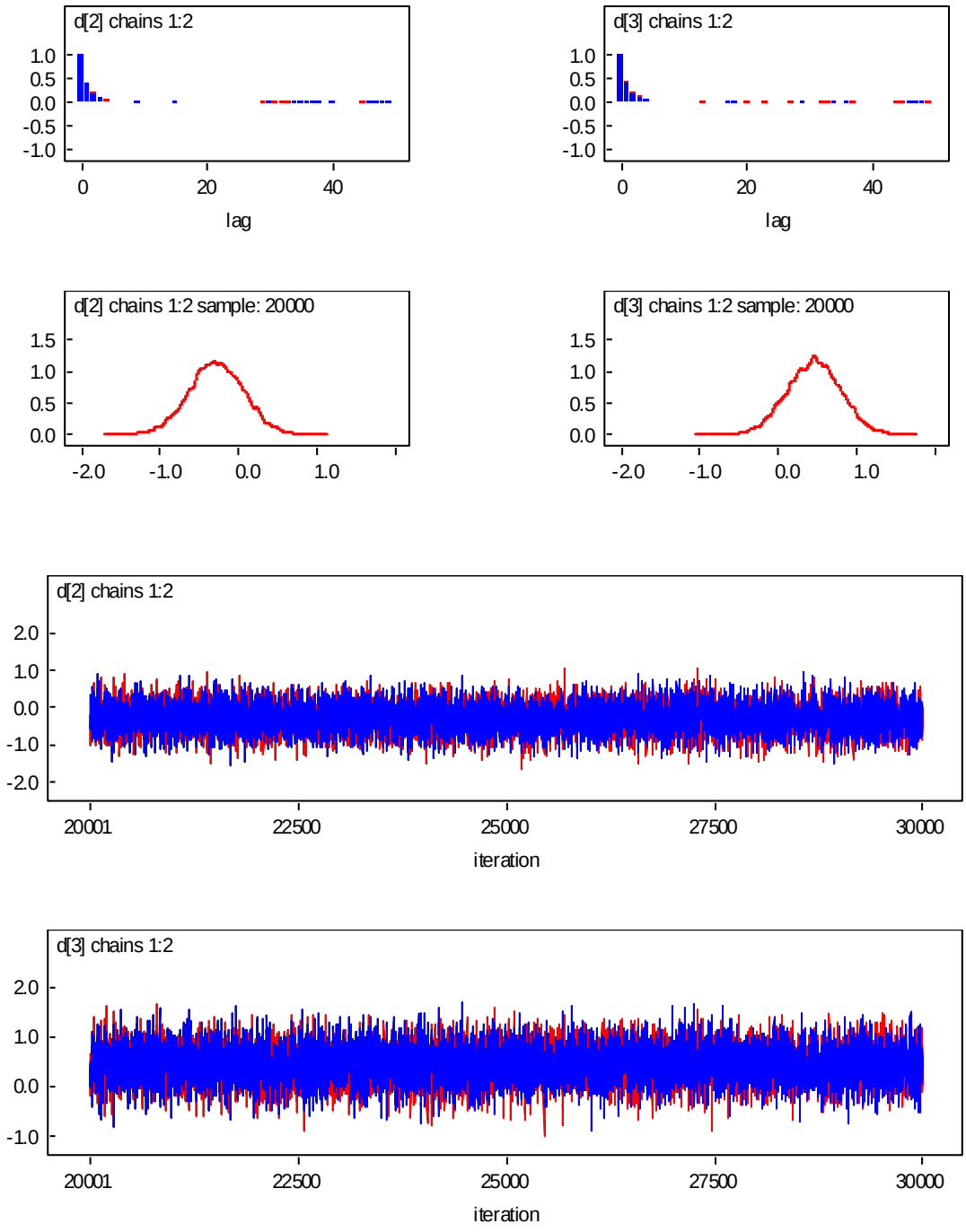
### 5.5.3 Response

**Figure A16: Convergence, autocorrelation and density plots**



### 5.5.4 High Response

**Figure A17: Convergence, autocorrelation and density plots**

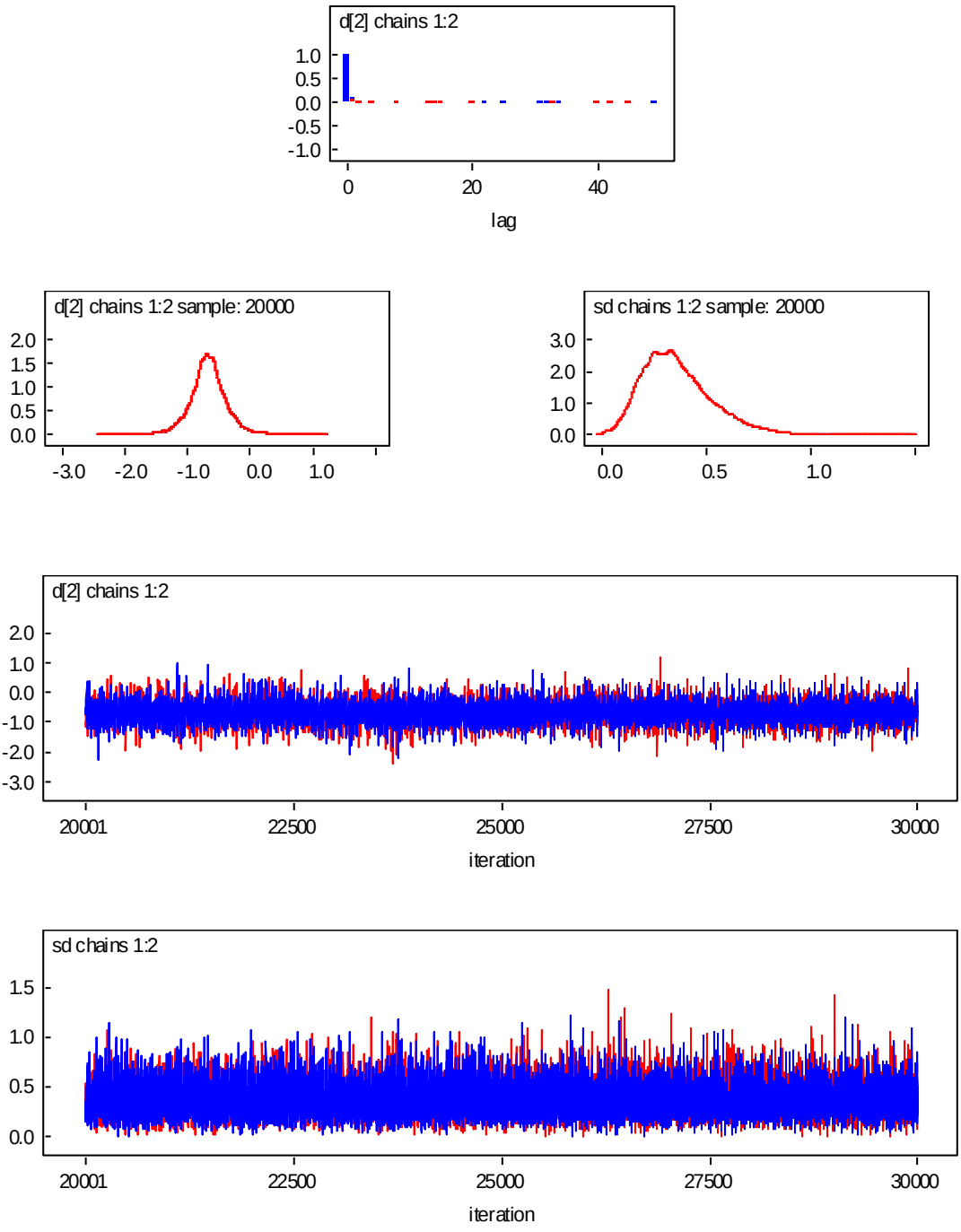


# 6. Appendix A2 - Random-effect models

## 6.1 Week 0-2

### 6.1.1 Non response

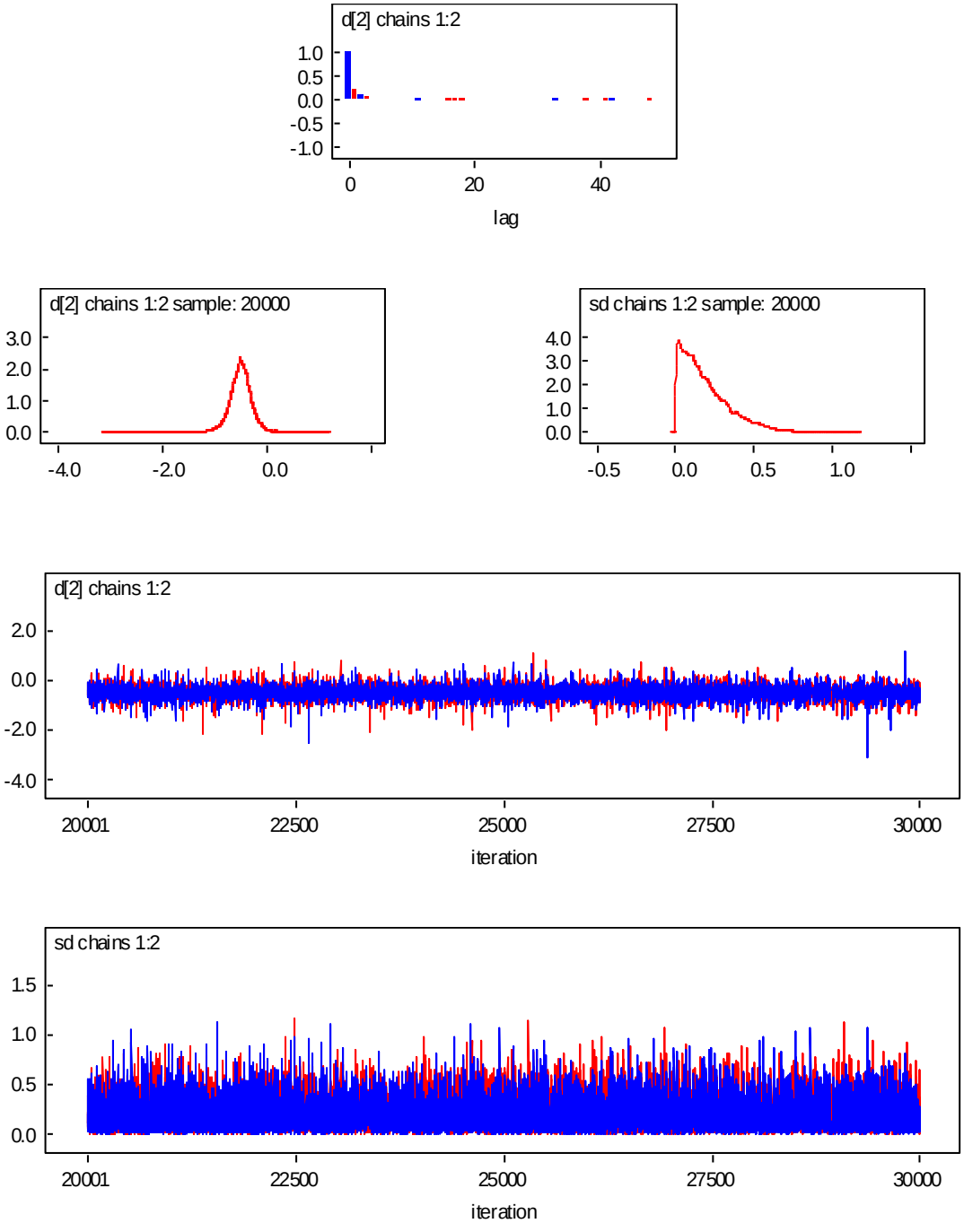
**Figure A18: Convergence, autocorrelation and density plots**



## 6.2 Week 2-4

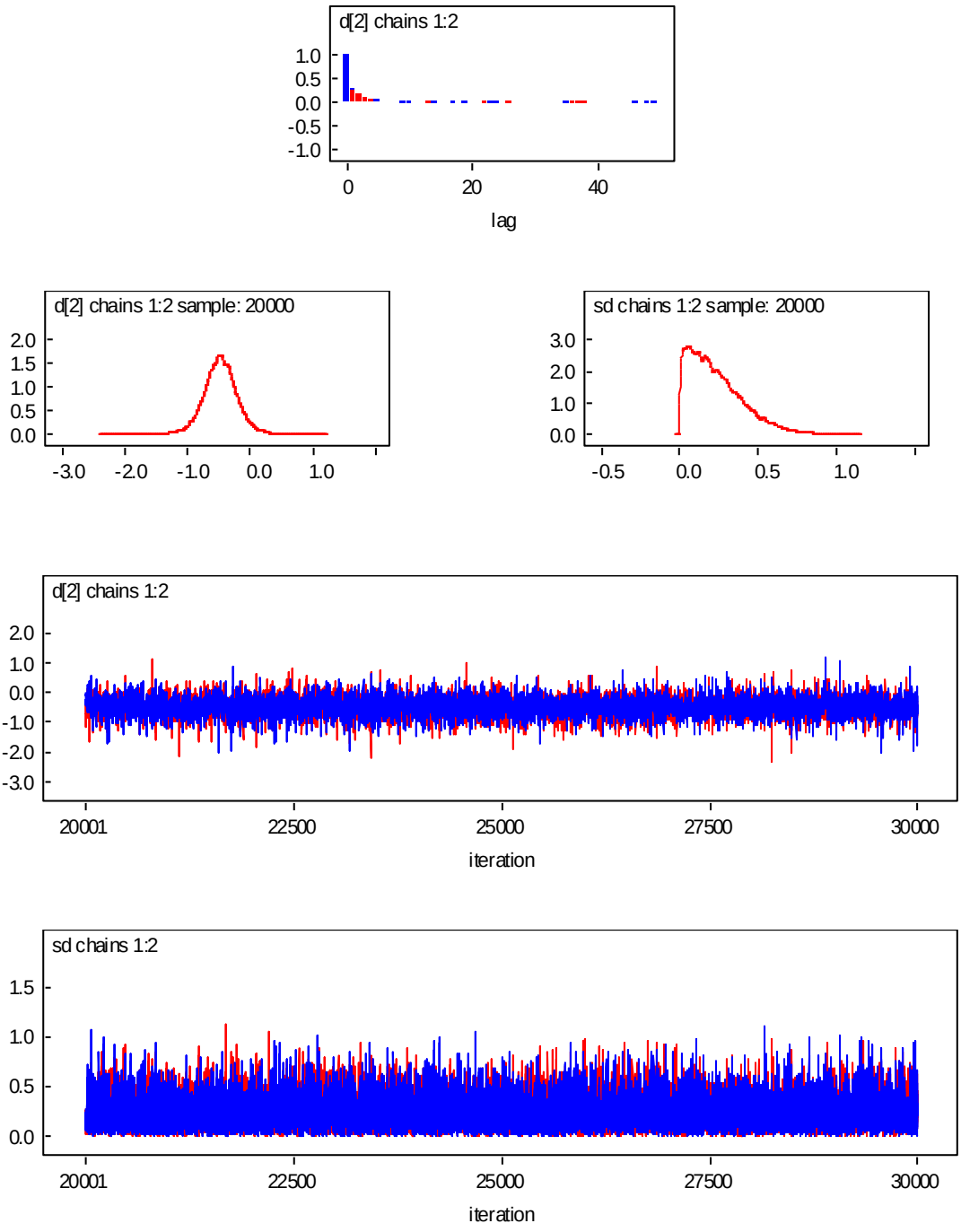
### 6.2.1 Non response

**Figure A19: Convergence, autocorrelation and density plots**



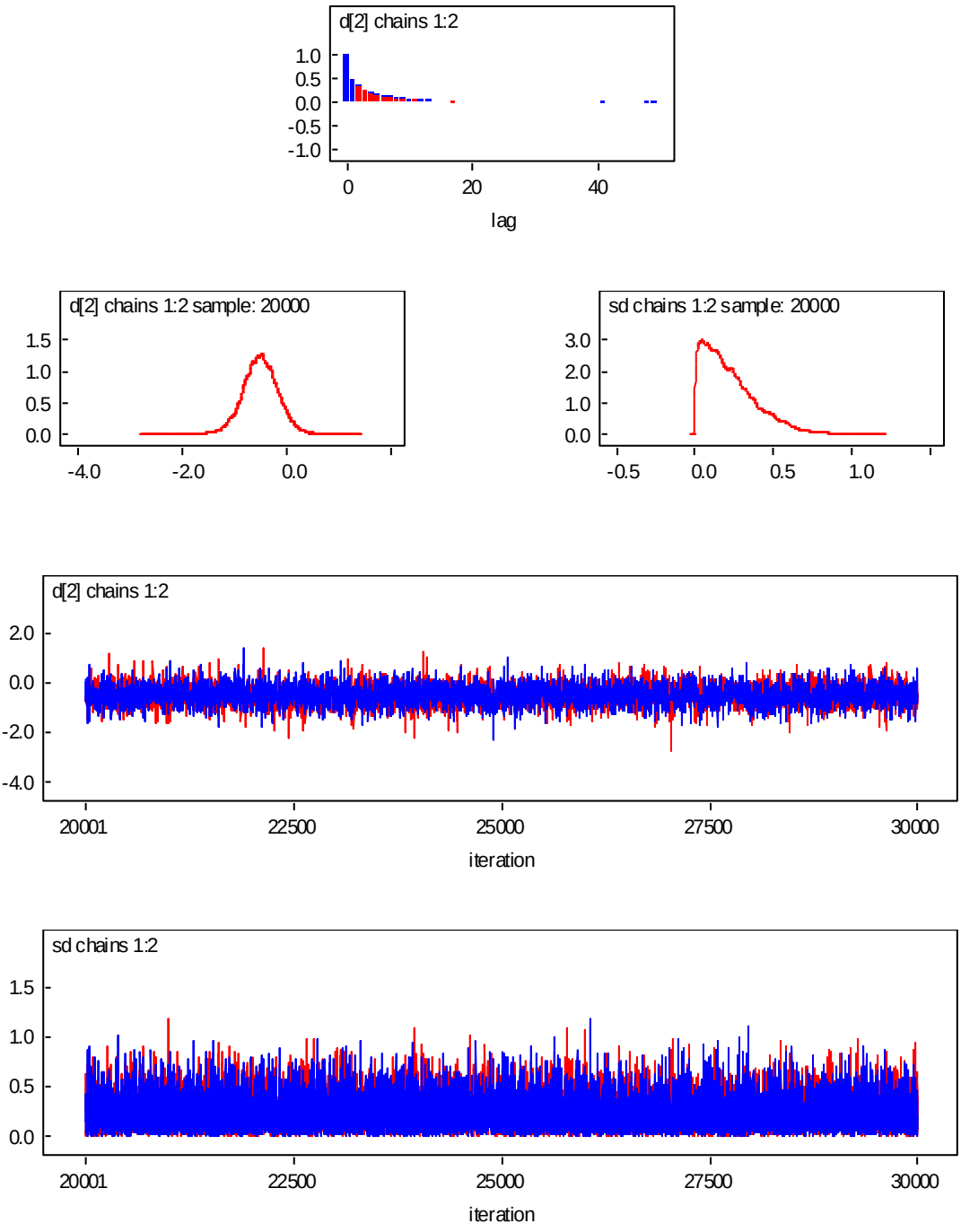
### 6.2.2 Partial response

**Figure A20: Convergence, autocorrelation and density plots**



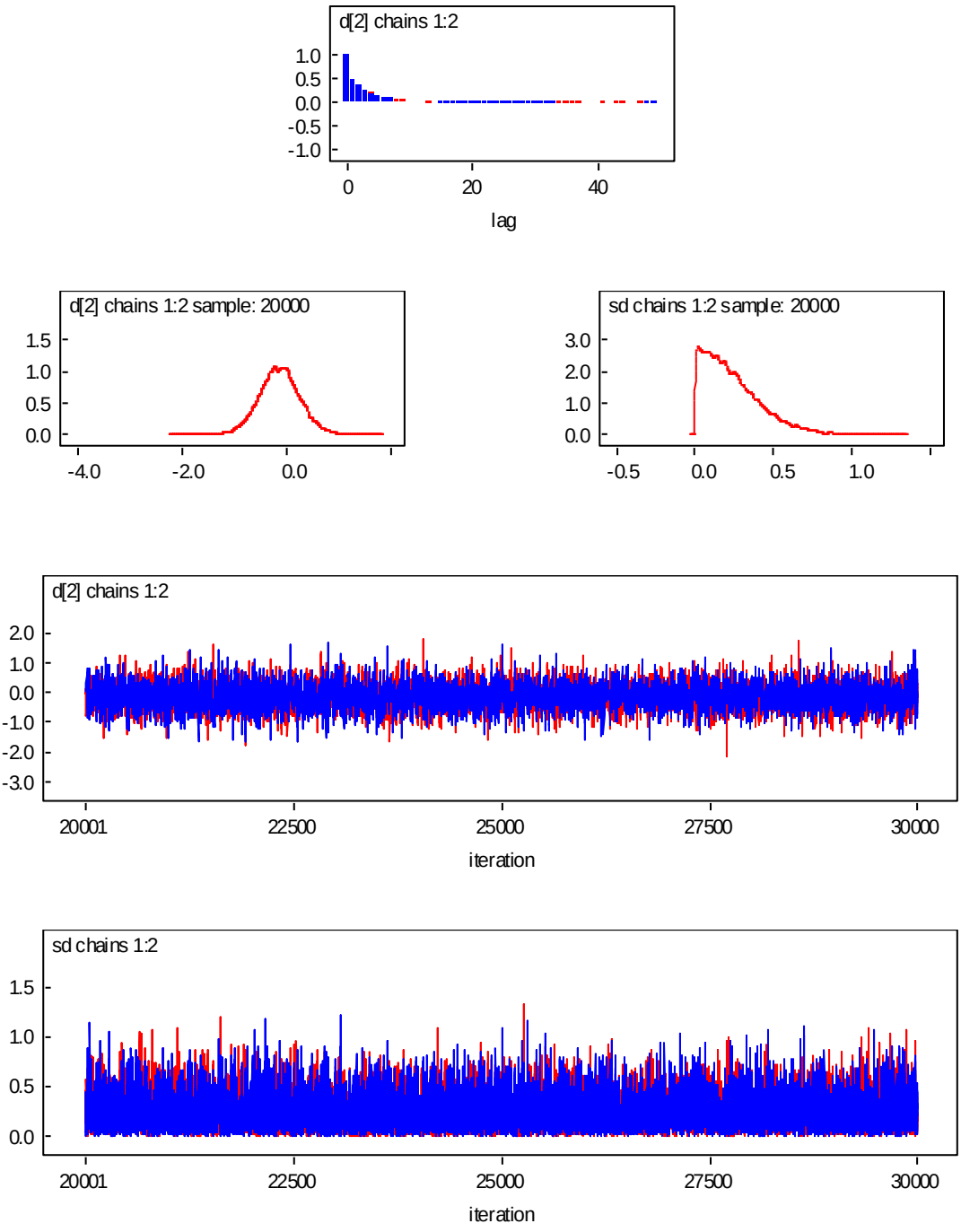
### 6.2.3 Response

**Figure A21: Convergence, autocorrelation and density plots**



### 6.2.4 High response

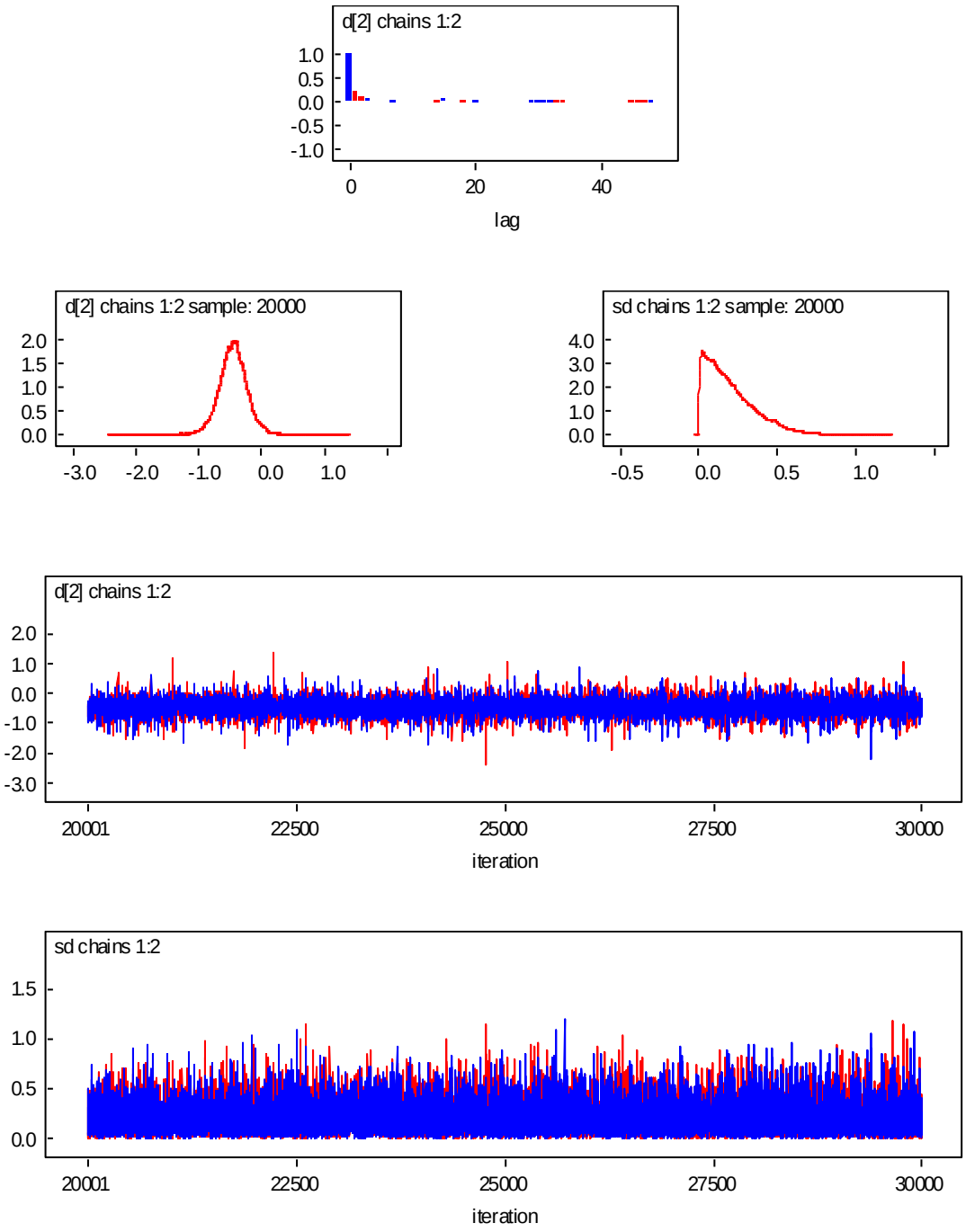
**Figure A22: Convergence, autocorrelation and density plots**



## 6.3 Week 4-8

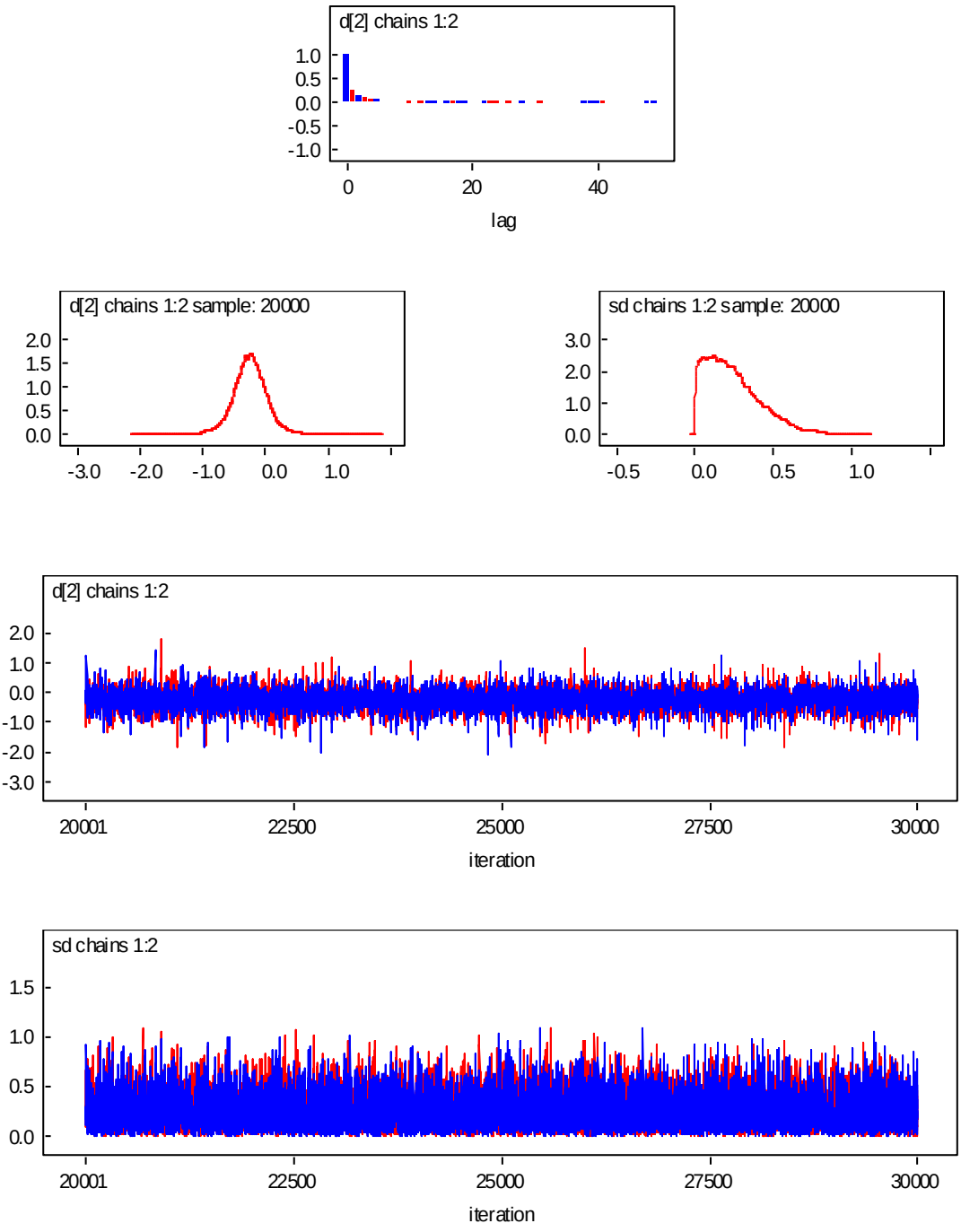
### 6.3.1 Non response

**Figure A23: Convergence, autocorrelation and density plots**



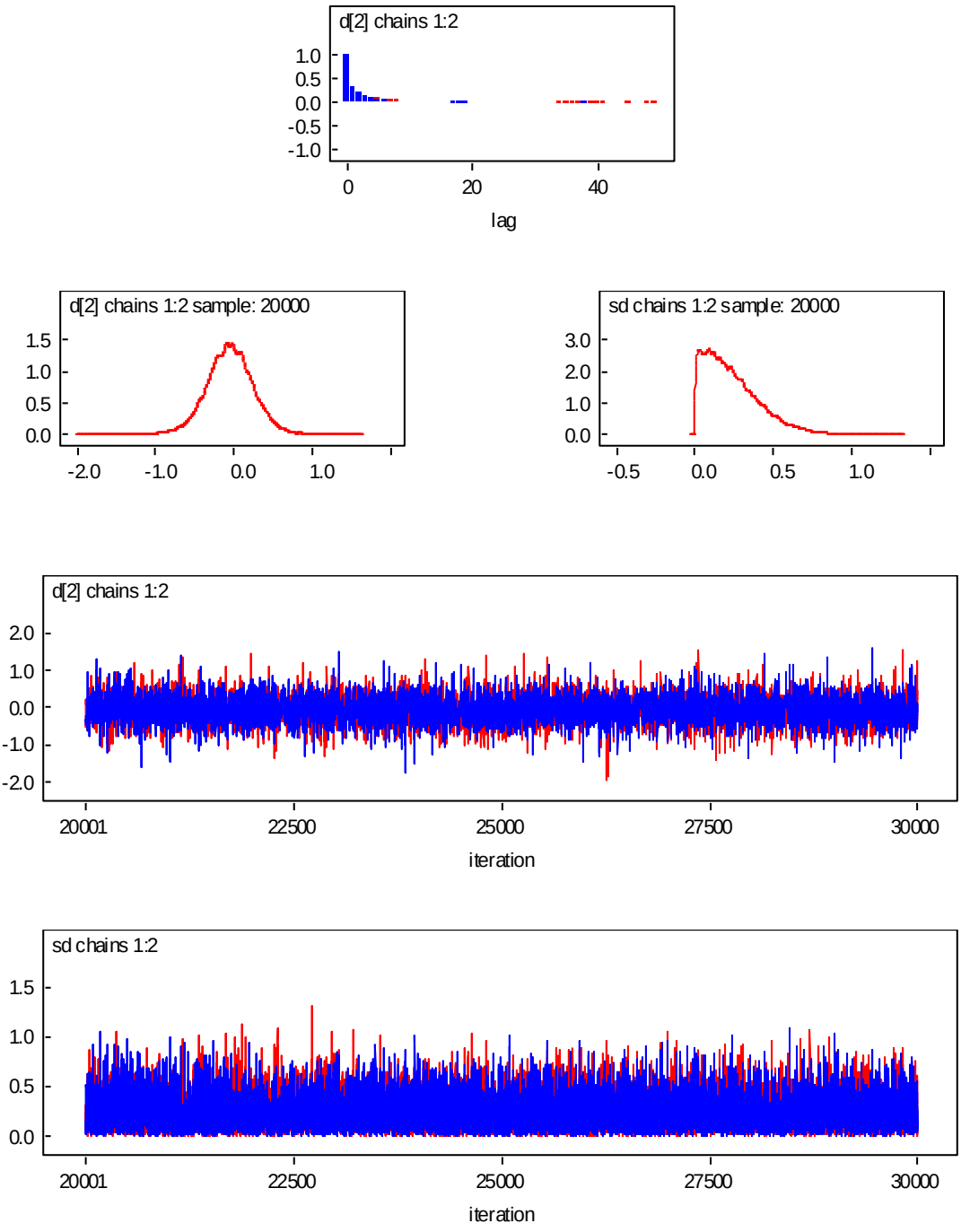
### 6.3.2 Partial response

**Figure A24: Convergence, autocorrelation and density plots**



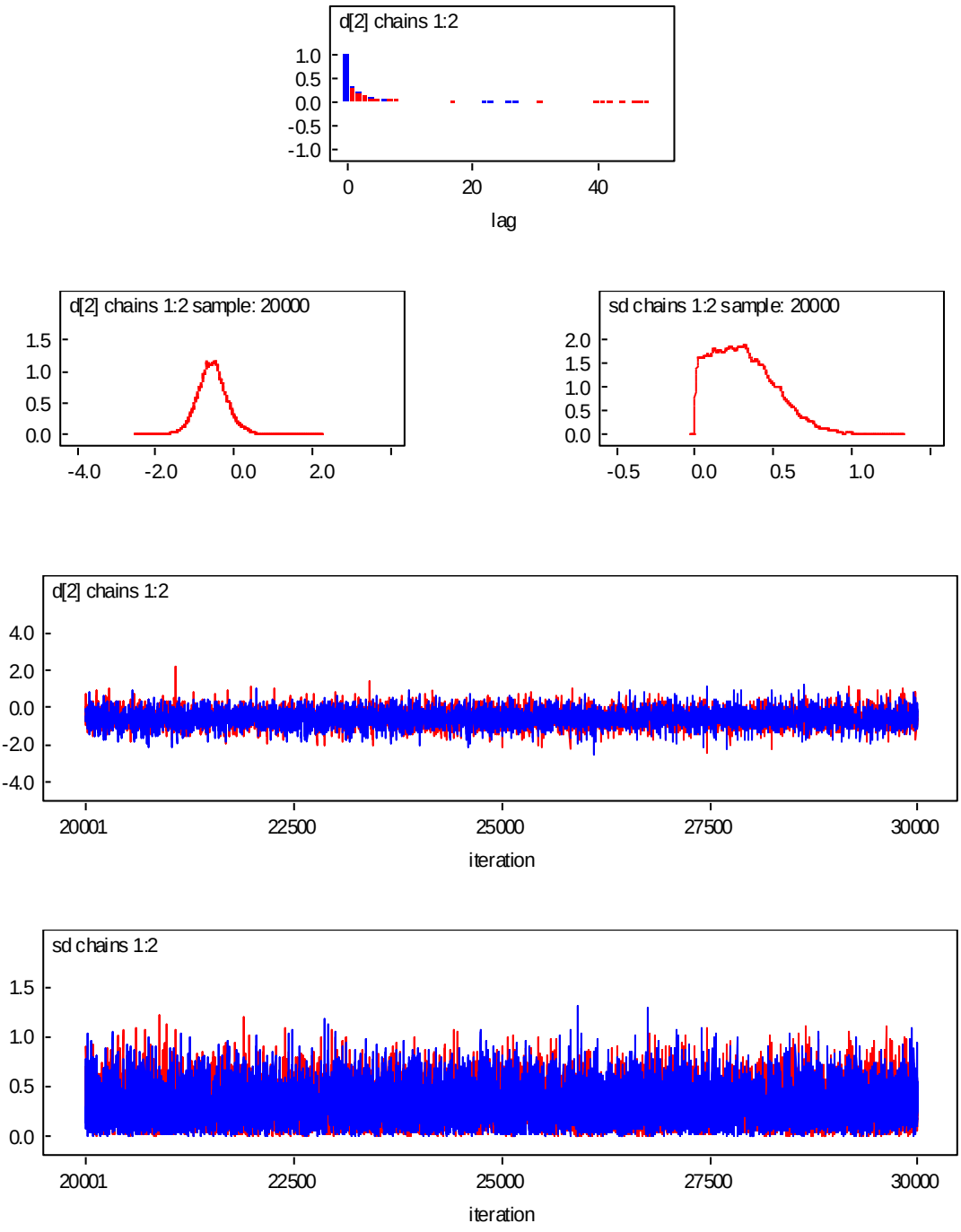
### 6.3.3 Response

**Figure A25: Convergence, autocorrelation and density plots**



### 6.3.4 High response

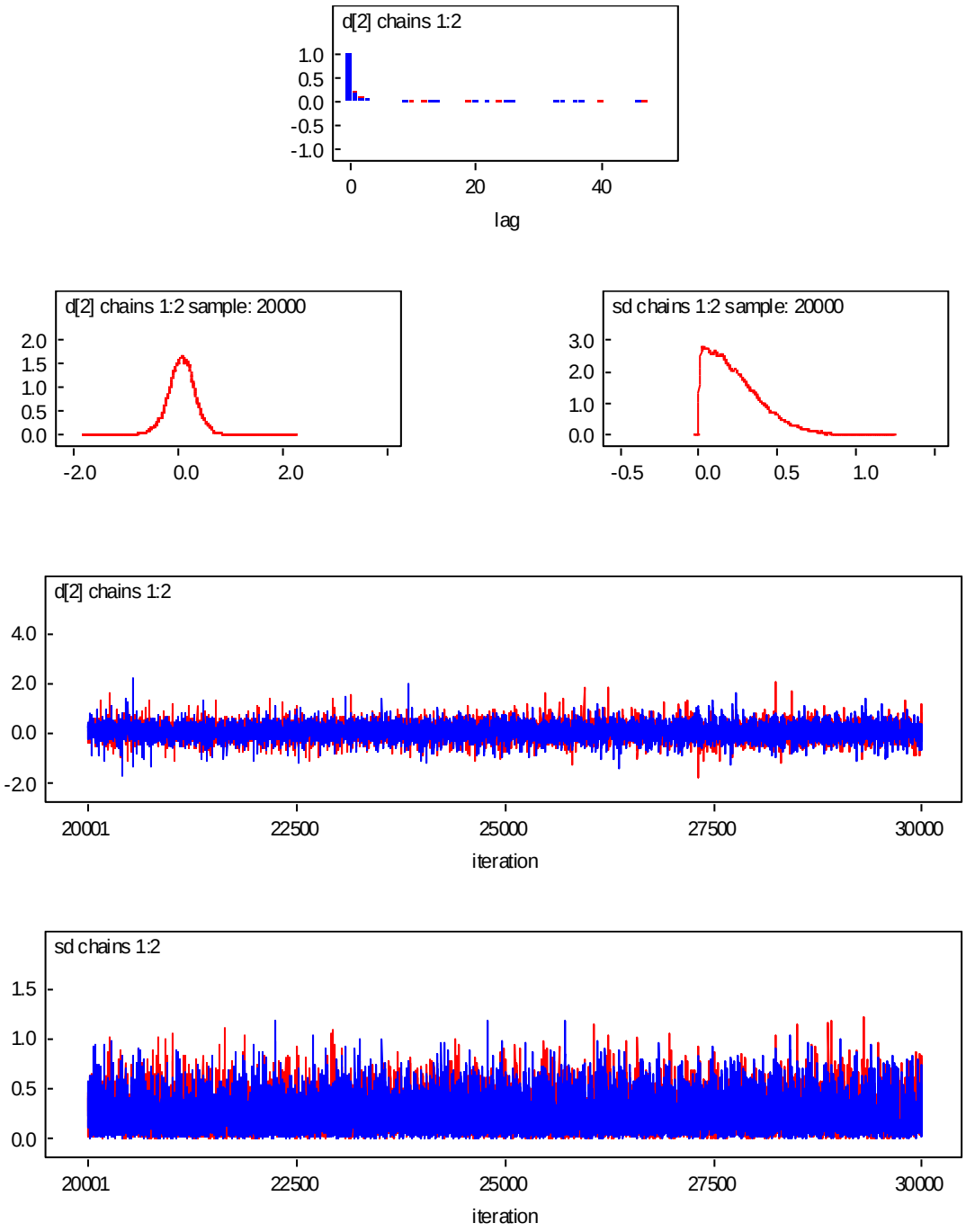
**Figure A26: Convergence, autocorrelation and density plots**



## 6.4 Week 8-12

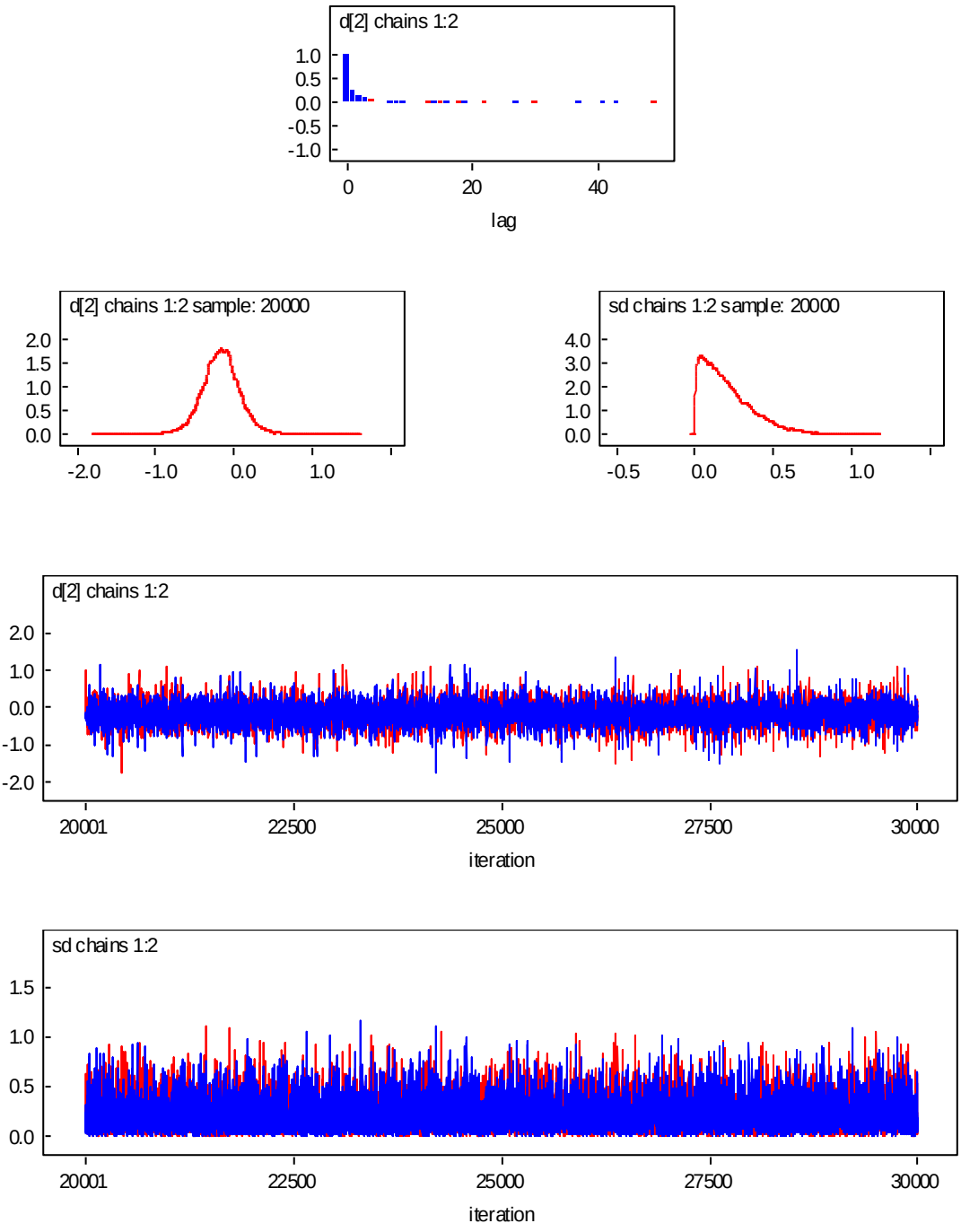
### 6.4.1 Non response

**Figure A27: Convergence, autocorrelation and density plots**



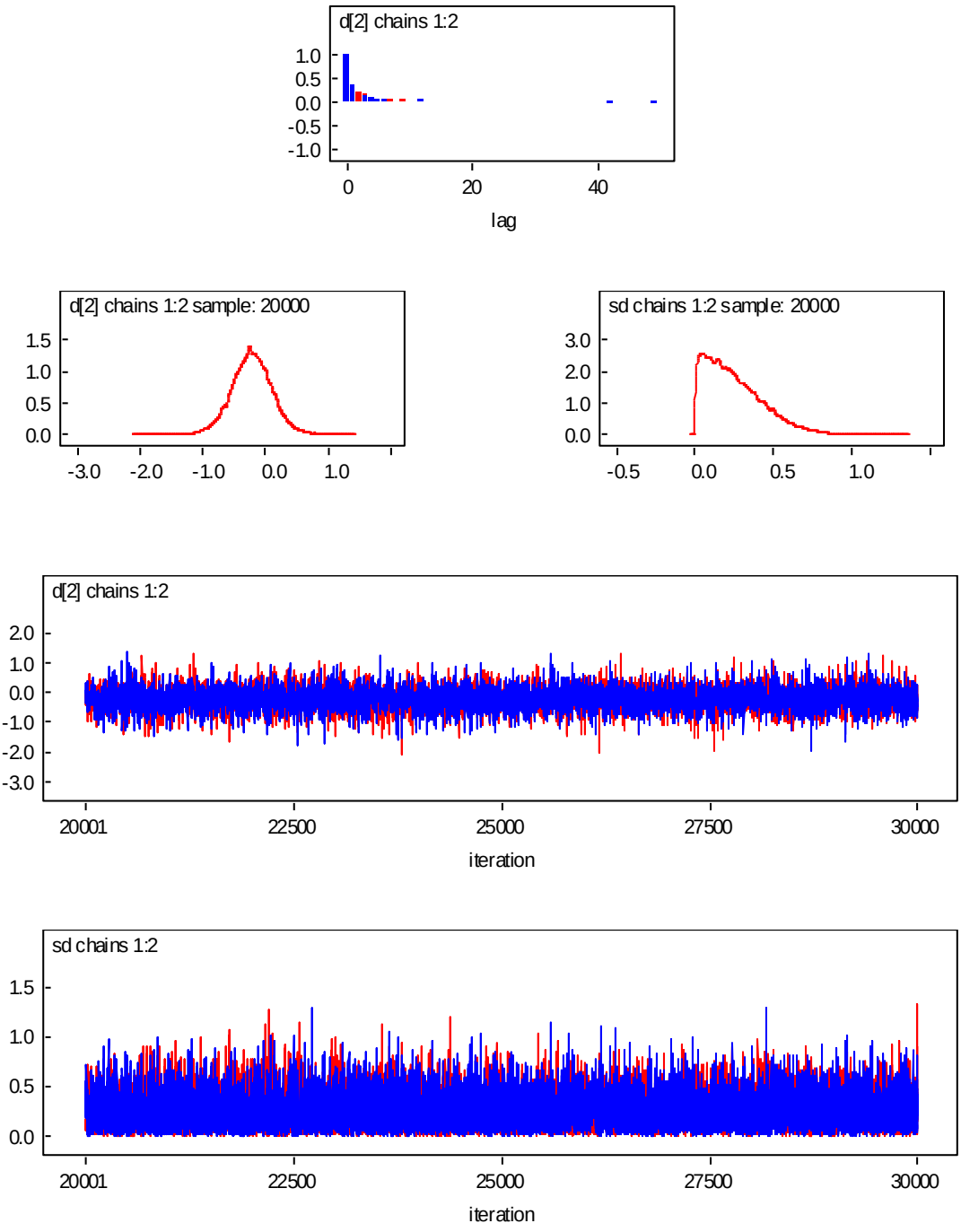
### 6.4.2 Partial response

**Figure A28: Convergence, autocorrelation and density plots**



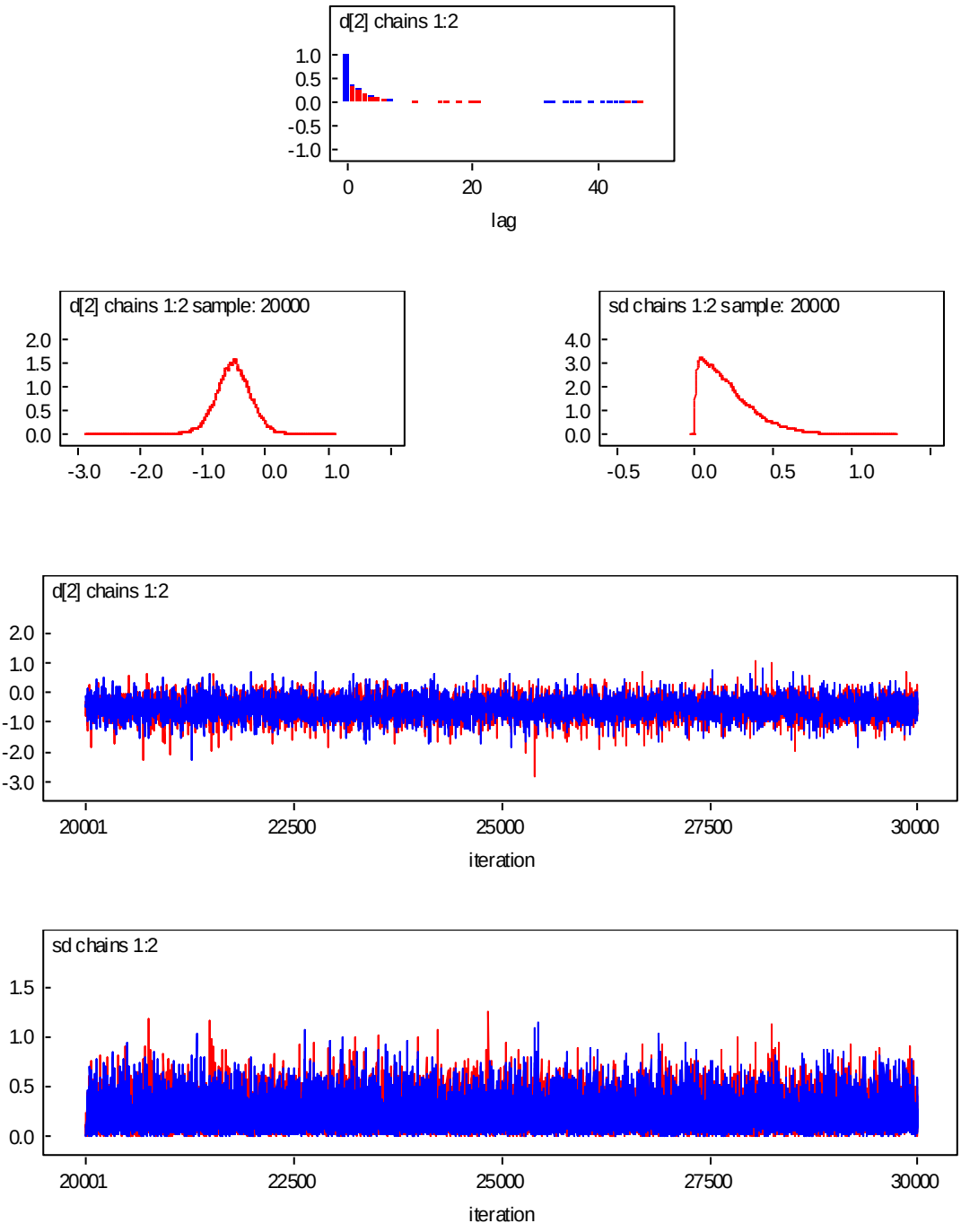
### 6.4.3 Response

**Figure A29: Convergence, autocorrelation and density plots**



### 6.4.4 High response

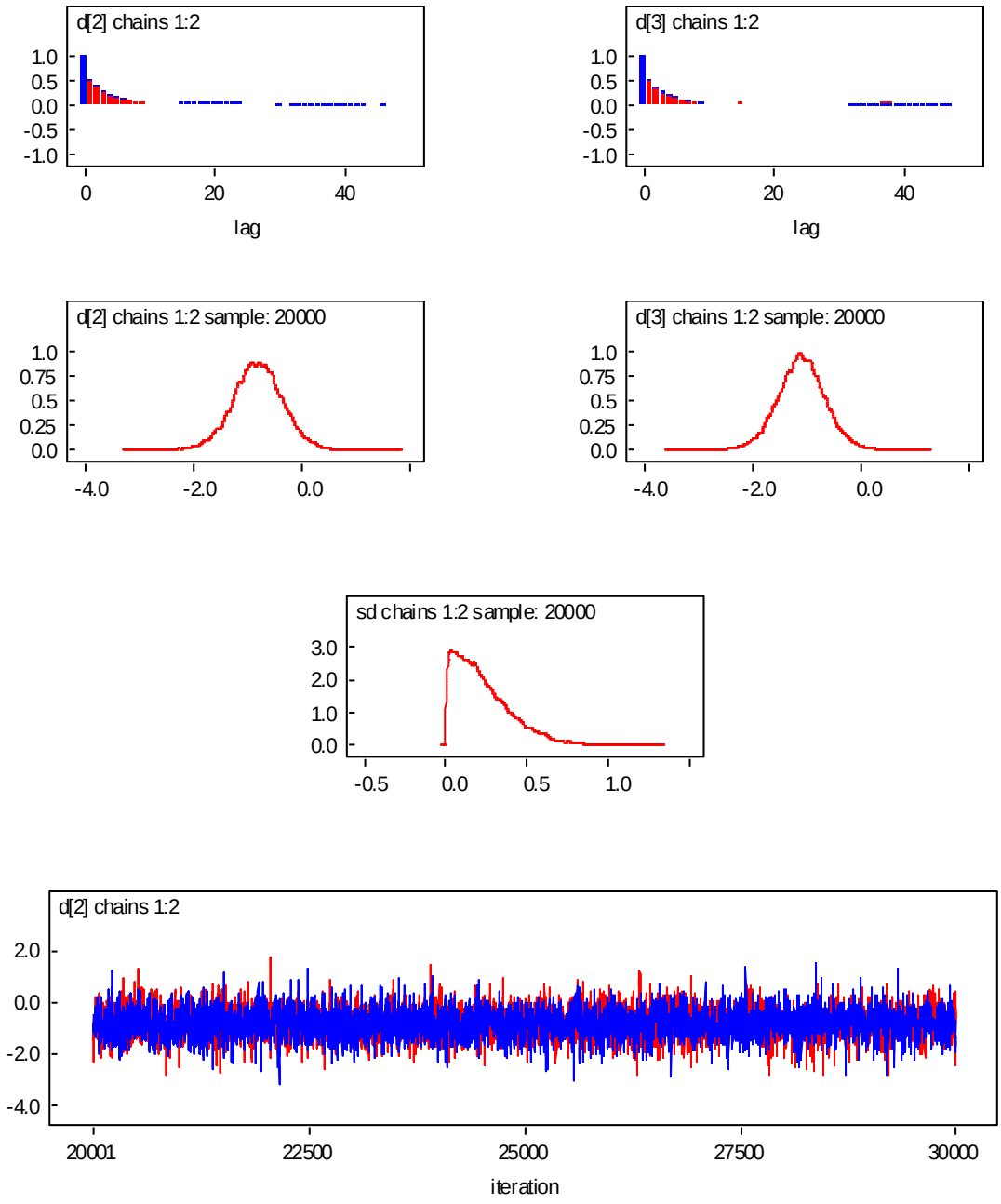
**Figure A30: Convergence, autocorrelation and density plots**

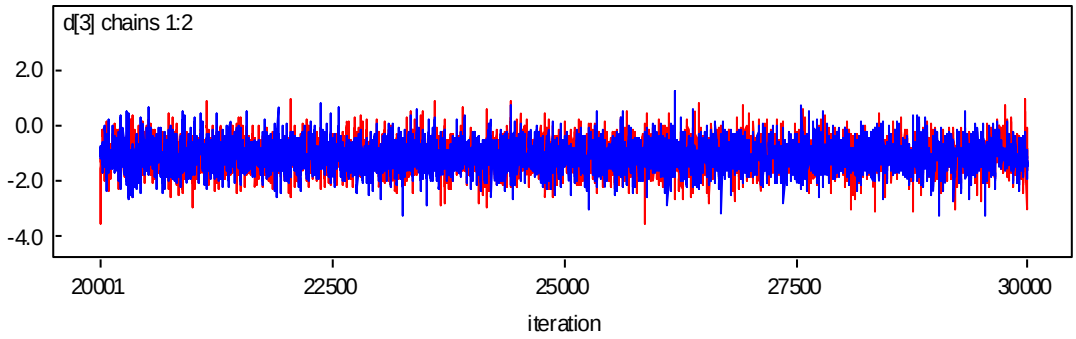


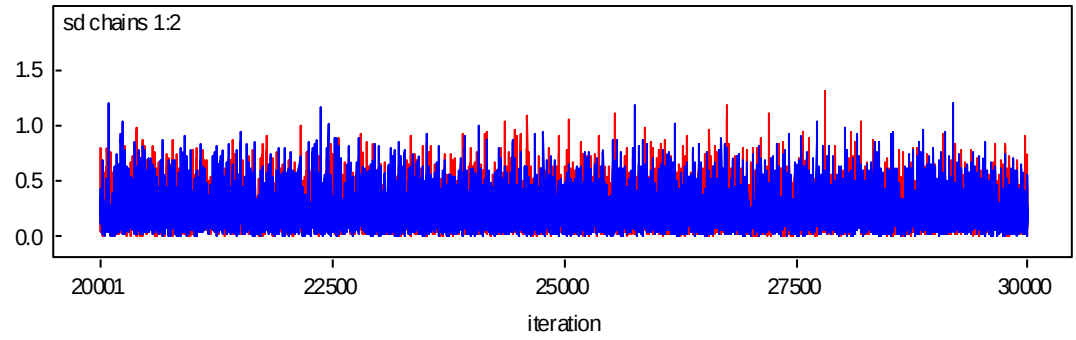
## 6.5 Week 12-36

### 6.5.1 Non response

**Figure A31: Convergence, autocorrelation and density plots**

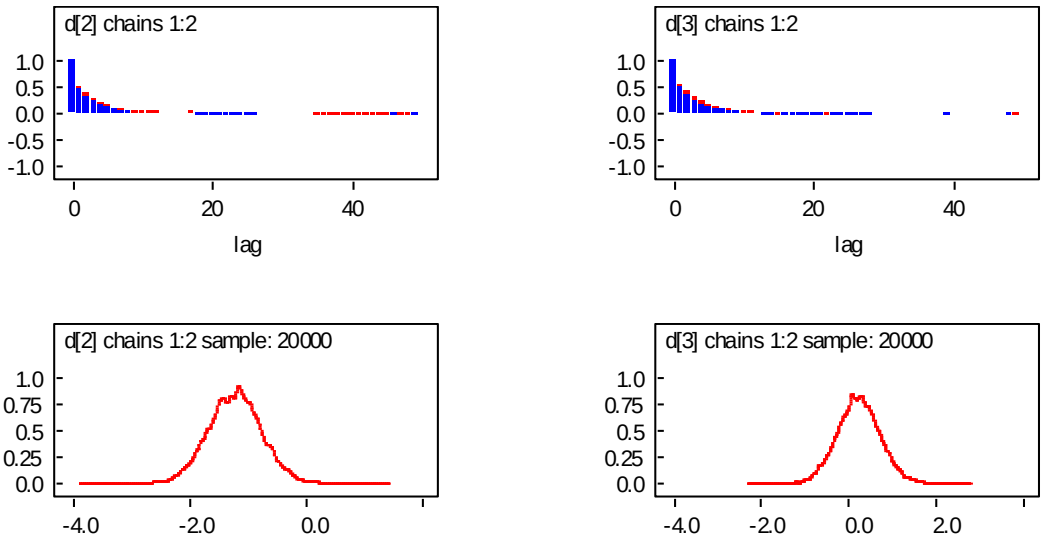


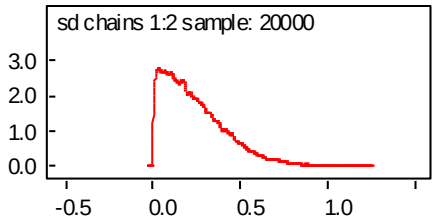


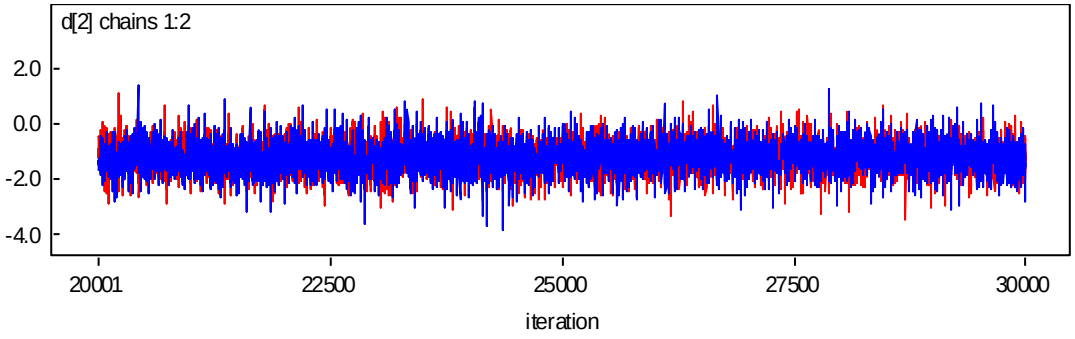



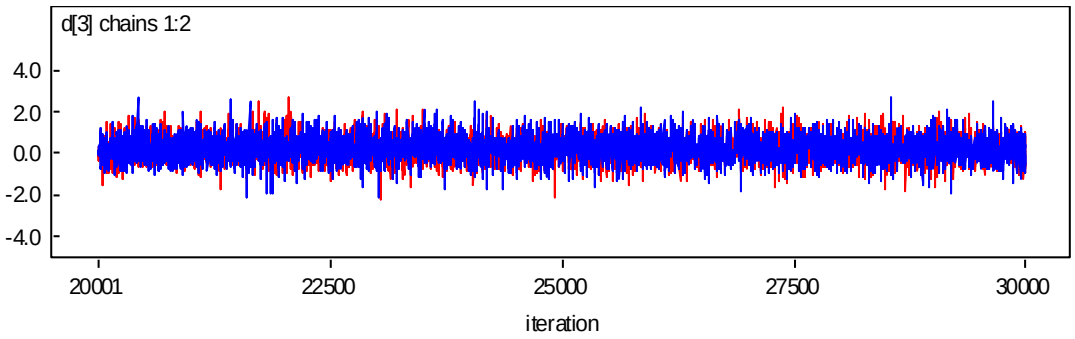

### 6.5.2 Partial response

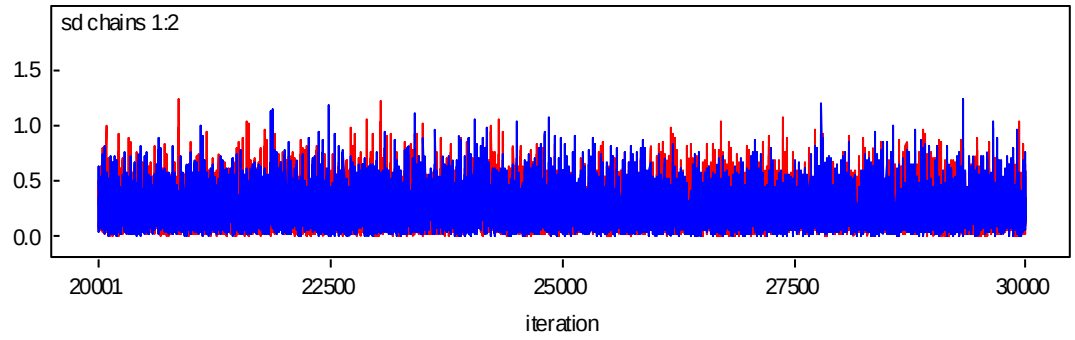
**Figure A32: Convergence, autocorrelation and density plots**




sd chains 1:2 sample: 20000
3.0
2.0
1.0
0.0
-0.5
0.0
0.5
1.0

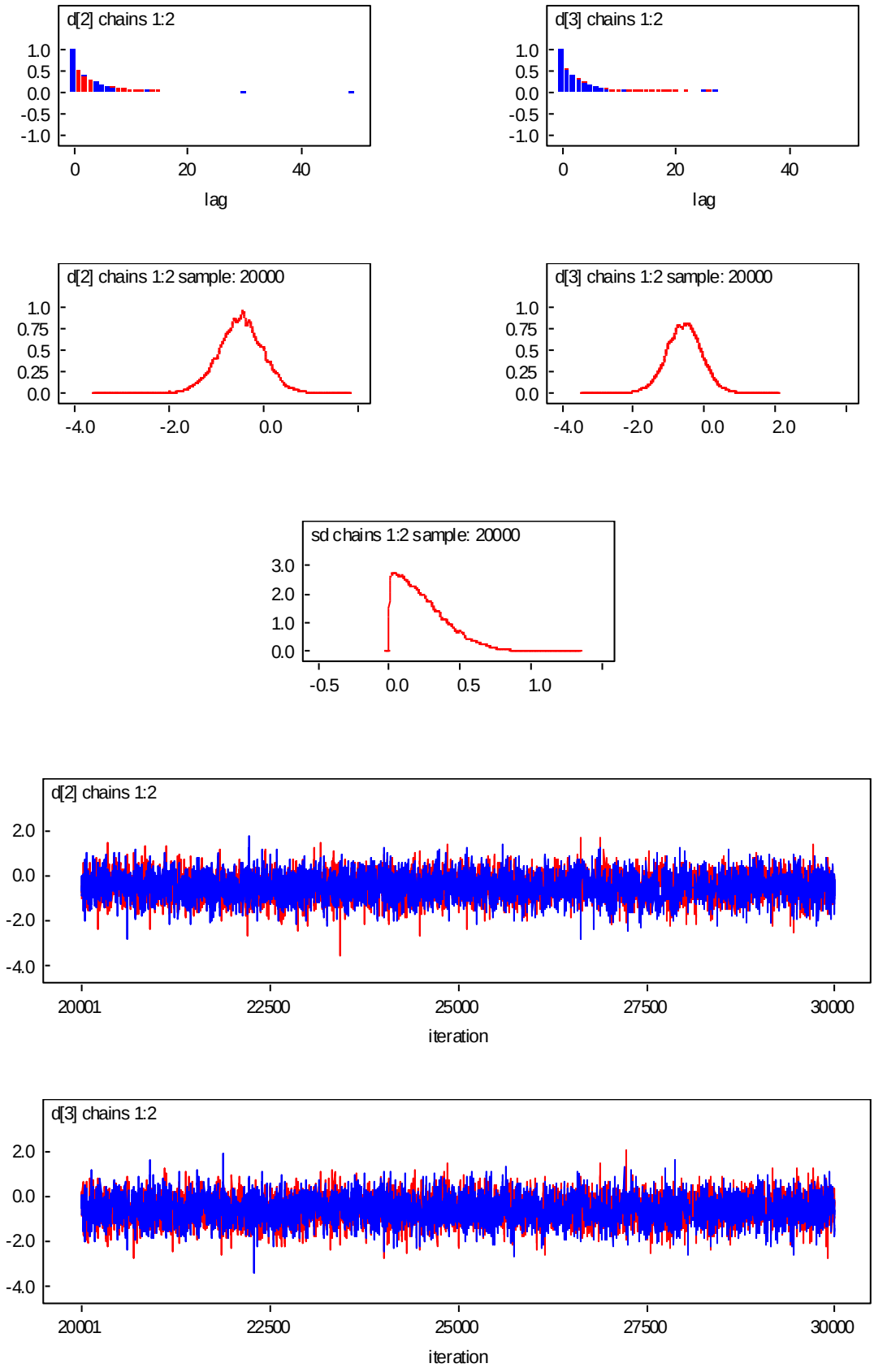

d[2] chains 1:2
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration

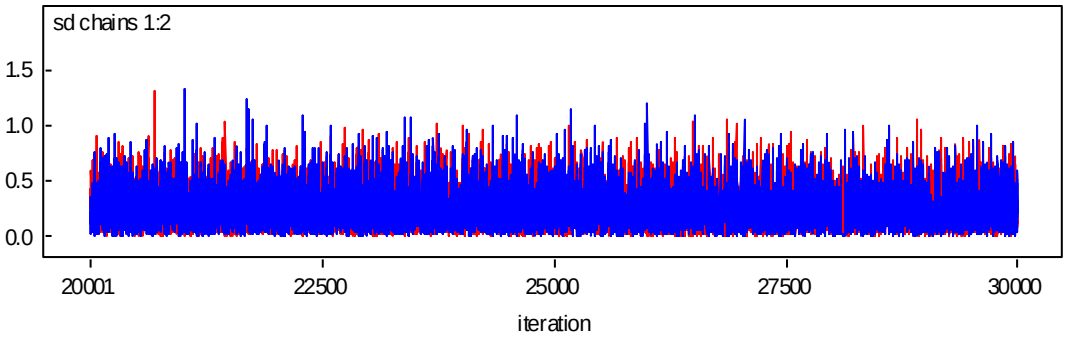

d[3] chains 1:2
4.0
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration


sd chains 1:2
1.5
1.0
0.5
0.0
20001
22500
25000
27500
30000
iteration

### 6.5.3 Response

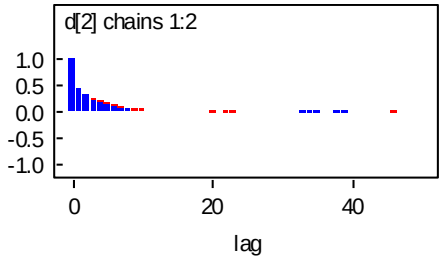
**Figure A33: Convergence, autocorrelation and density plots**

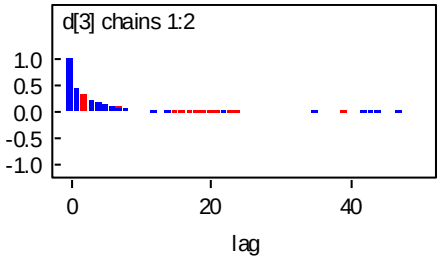


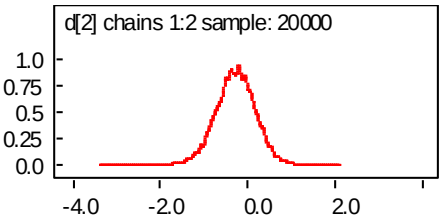


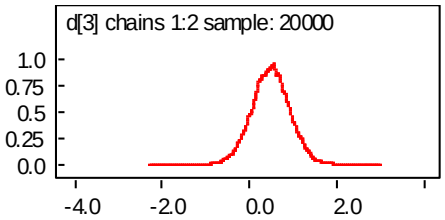

### 6.5.4 High Response

**Figure A34: Convergence, autocorrelation and density plots**

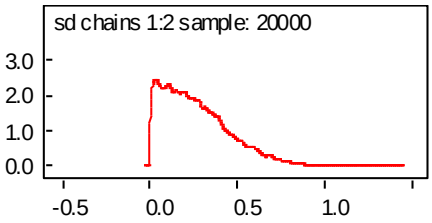


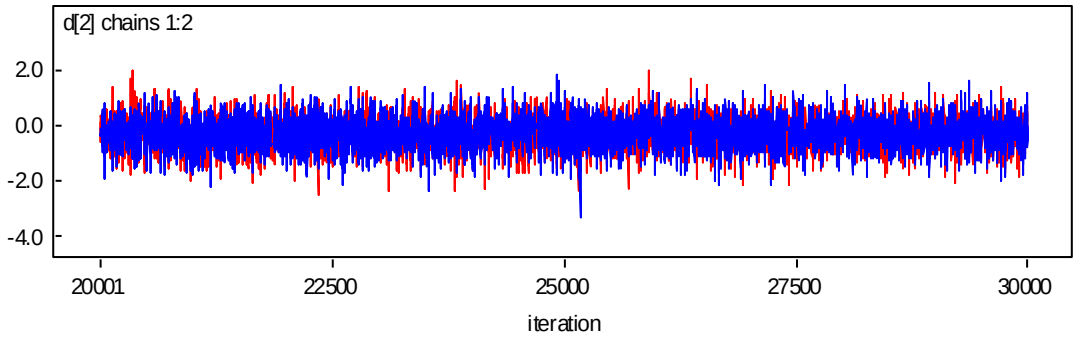



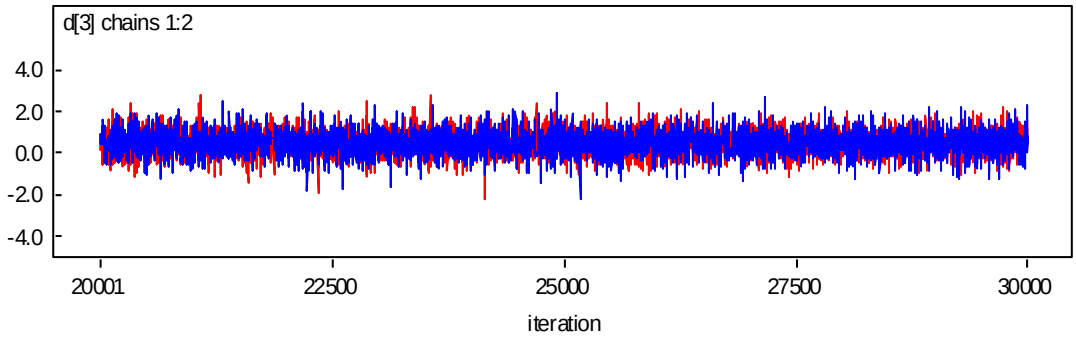



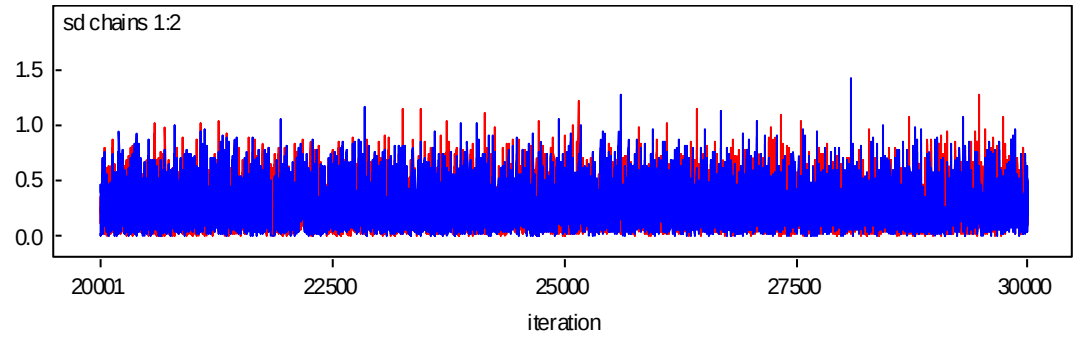




c




d[2] chains 1:2
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration


d[3] chains 1:2
4.0
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration


sd chains 1:2
1.5
1.0
0.5
0.0
20001
22500
25000
27500
30000
iteration

# Statistical outputs of ordered categorical NMA

# Partial Responders Scenario Analysis

# 11 March 2016

# Table of contents

# 1. Overview

Summary statistics obtained from WinBUGS output are presented in Sections 3 and 4 for each time point and response level. Both fixed-effect and random-effects results are presented; a total of 17 models were fitted to the data. Results for the parameters monitored within the analysis are presented in tabular format and show the mean, standard deviation (SD), Monte Carlo (MC) error, $50^{th}$ quantile (median), $2.5^{th}$ quantile, $97.5^{th}$ quantile, the burn-in period used and the number of iterations retained of which summary statistics are based upon. Model diagnostic plots are presented in Appendix A1 and Appendix A2 for fixed and random-effects results, respectively. These show the history trace plots for each chain and density plots for the relative treatment effect(s) ("d") and the standard deviation ("sd"). Autocorrelation is also assessed for the relative treatment effect(s).

# 2. Methods

The ordered categorical NMA was run using the code shown in example 6 of the DSU TSD2. Vague non-informative normal priors with a mean of 0 and a variance of 1000 were given to the study effects (mu) and treatment effects (d). The z.aux node was given a uniform prior between 0 and 5. The between-study standard deviation in the random-effects model was given a half-normal prior with a mean of 0 and a variance of $0.32^2$ as recommended in DSU TSD3. A less informative uniform prior was initially tested, however due to the fact the between-study variance needed to be estimated based on only 2 studies, a half-normal distribution proved to be a better modelling choice. A model was fitted for each starting health state and each transition time.

The models were fitted to the data via Bayesian Markov chain Monte Carlo (MCMC) methods (Gibbs sampling) and implemented in WinBUGS, version 1.4.3. They were run using 2 chains with different sets of initial values. For each analysis, an initial 20,000 iterations were run as a burn-in period to achieve convergence and then discarded. Results are based on a further 10,000 iterations (per chain), using a thinning interval of 10. Convergence towards sensible posterior distributions was assessed visually at the end of each simulation using the history trace plots, the smoothed Kernel posterior density plots. Autocorrelation plots were also checked to ensure the chains were mixing well and the magnitude of the MC error was compared to the standard deviation of the posterior distributions to ensure enough iterations had been saved. Both fixed-effect and random-effects models were run for each outcome. Their performances can be compared using the total residual deviance and the Deviance Information Criterion (DIC). A total of 20,000 CODA samples were retained and utilised directly in the cost-effectiveness model.

# 3. Fixed-effect models

## 3.1 Week 0-2

### 3.1.1 Non-response

**Table 1: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.7286 | 0.07977 | 5.71E-04 | 57.41% | 0.7281 | 88.49% | 20001 | 20000 |
| T[1,1] | 0.2338 | 0.02437 | 1.75E-04 | 0.1881 | 0.2333 | 0.283 | 20001 | 20000 |
| T[1,2] | 0.495 | 0.05002 | 4.36E-04 | 0.3974 | 0.4945 | 0.5932 | 20001 | 20000 |
| T[2,1] | 0.1217 | 0.01832 | 1.33E-04 | 0.08833 | 0.1207 | 0.1602 | 20001 | 20000 |
| T[2,2] | 0.3258 | 0.04685 | 4.18E-04 | 0.2378 | 0.3243 | 0.4202 | 20001 | 20000 |
| T[3,1] | 0.04018 | 0.009098 | 6.66E-05 | 0.02463 | 0.03934 | 0.0604 | 20001 | 20000 |
| T[3,2] | 0.151 | 0.03234 | 2.88E-04 | 0.09413 | 0.1487 | 0.2201 | 20001 | 20000 |
| TP[1,1] | 0.7662 | 0.02437 | 1.75E-04 | 0.717 | 0.7667 | 0.8119 | 20001 | 20000 |
| TP[1,2] | 0.1122 | 0.01211 | 8.49E-05 | 0.08925 | 0.1118 | 0.1372 | 20001 | 20000 |
| TP[1,3] | 0.08148 | 0.01186 | 8.43E-05 | 0.05981 | 0.0809 | 0.1065 | 20001 | 20000 |
| TP[1,4] | 0.04018 | 0.009098 | 6.66E-05 | 0.02463 | 0.03934 | 0.0604 | 20001 | 20000 |
| TP[2,1] | 0.505 | 0.05002 | 4.36E-04 | 0.4068 | 0.5055 | 0.6026 | 20001 | 20000 |
| TP[2,2] | 0.1693 | 0.01673 | 1.15E-04 | 0.1379 | 0.1689 | 0.2034 | 20001 | 20000 |
| TP[2,3] | 0.1748 | 0.02216 | 1.74E-04 | 0.1327 | 0.1744 | 0.2191 | 20001 | 20000 |
| TP[2,4] | 0.151 | 0.03234 | 2.88E-04 | 0.09413 | 0.1487 | 0.2201 | 20001 | 20000 |
| d[2] | -0.716 | 0.09847 | 9.87E-04 | -0.9055 | -0.7161 | -0.5219 | 20001 | 20000 |
| totresdev | 24.04 | 3.186 | 2.52E-02 | 19.86 | 23.38 | 31.94 | 20001 | 20000 |
| z[2] | 0.443 | 0.0437 | 3.08E-04 | 0.3602 | 0.4413 | 0.5316 | 20001 | 20000 |
| z[3] | 1.03 | 0.06841 | 4.93E-04 | 0.9 | 1.029 | 1.168 | 20001 | 20000 |

**Table 2: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 78.582 | 73.562 | 5.02 | 83.602 |
| total | 78.582 | 73.562 | 5.02 | 83.602 |

## 3.2 Week 2-4

### 3.2.1 Non response

**Table 3: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.8203 | 0.09461 | 7.18E-04 | 63.30% | 0.8206 | 100.40% | 20001 | 20000 |
| T[1,1] | 0.2071 | 0.02699 | 2.05E-04 | 0.1577 | 0.2059 | 0.2634 | 20001 | 20000 |
| T[1,2] | 0.3769 | 0.0606 | 5.06E-04 | 0.2642 | 0.375 | 0.5009 | 20001 | 20000 |
| T[2,1] | 0.1095 | 0.0205 | 1.60E-04 | 0.07358 | 0.1081 | 0.153 | 20001 | 20000 |
| T[2,2] | 0.2346 | 0.05128 | 4.36E-04 | 0.1438 | 0.2316 | 0.343 | 20001 | 20000 |
| T[3,1] | 0.03179 | 0.009798 | 7.51E-05 | 0.01616 | 0.0307 | 0.05382 | 20001 | 20000 |
| T[3,2] | 0.08908 | 0.02999 | 2.56E-04 | 0.04117 | 0.08521 | 0.158 | 20001 | 20000 |
| TP[1,1] | 0.7929 | 0.02699 | 2.05E-04 | 0.7366 | 0.7941 | 0.8424 | 20001 | 20000 |
| TP[1,2] | 0.09755 | 0.0141 | 1.06E-04 | 0.07172 | 0.09692 | 0.127 | 20001 | 20000 |
| TP[1,3] | 0.07771 | 0.01455 | 1.13E-04 | 0.05219 | 0.07675 | 0.109 | 20001 | 20000 |
| TP[1,4] | 0.03179 | 0.009798 | 7.51E-05 | 0.01616 | 0.0307 | 0.05382 | 20001 | 20000 |
| TP[2,1] | 0.6231 | 0.0606 | 5.06E-04 | 0.4992 | 0.625 | 0.7359 | 20001 | 20000 |
| TP[2,2] | 0.1423 | 0.02116 | 1.64E-04 | 0.1031 | 0.1415 | 0.1862 | 20001 | 20000 |
| TP[2,3] | 0.1456 | 0.02892 | 2.33E-04 | 0.09409 | 0.1441 | 0.2064 | 20001 | 20000 |
| TP[2,4] | 0.08908 | 0.02999 | 2.56E-04 | 0.04117 | 0.08521 | 0.158 | 20001 | 20000 |
| d[2] | -0.5027 | 0.1311 | 1.13E-03 | -0.7581 | -0.502 | -0.2468 | 20001 | 20000 |
| totresdev | 14.81 | 3.126 | 2.30E-02 | 10.67 | 14.16 | 22.59 | 20001 | 20000 |
| z[2] | 0.4162 | 0.05644 | 4.46E-04 | 0.312 | 0.4135 | 0.533 | 20001 | 20000 |
| z[3] | 1.052 | 0.1002 | 7.68E-04 | 0.8622 | 1.05 | 1.255 | 20001 | 20000 |

**Table 4: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 61.264 | 56.314 | 4.95 | 66.213 |
| total | 61.264 | 56.314 | 4.95 | 66.213 |

### 3.2.2 Partial response

**Table 5: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.1129 | 0.2374 | 1.64E-03 | -57.93% | -0.1143 | 35.14% | 20001 | 20000 |
| T[1,1] | 0.5437 | 0.09163 | 6.30E-04 | 0.3627 | 0.5455 | 0.7191 | 20001 | 20000 |
| T[1,2] | 0.7119 | 0.1106 | 1.04E-03 | 0.4701 | 0.7221 | 0.8964 | 20001 | 20000 |
| T[2,1] | 0.2583 | 0.08521 | 5.46E-04 | 0.1117 | 0.2516 | 0.4448 | 20001 | 20000 |
| T[2,2] | 0.4272 | 0.1324 | 1.26E-03 | 0.1858 | 0.423 | 0.6933 | 20001 | 20000 |
| T[3,1] | 0.0626 | 0.03805 | 2.47E-04 | 0.01318 | 0.05476 | 0.1568 | 20001 | 20000 |
| T[3,2] | 0.1459 | 0.08407 | 7.72E-04 | 0.03057 | 0.1302 | 0.3501 | 20001 | 20000 |
| TP[1,1] | 0.4563 | 0.09163 | 6.30E-04 | 0.2812 | 0.4545 | 0.6373 | 20001 | 20000 |
| TP[1,2] | 0.2855 | 0.04567 | 3.17E-04 | 0.2005 | 0.284 | 0.378 | 20001 | 20000 |
| TP[1,3] | 0.1957 | 0.05858 | 3.85E-04 | 0.09136 | 0.1927 | 0.3195 | 20001 | 20000 |
| TP[1,4] | 0.0626 | 0.03805 | 2.47E-04 | 0.01318 | 0.05476 | 0.1568 | 20001 | 20000 |
| TP[2,1] | 0.2881 | 0.1106 | 1.04E-03 | 0.1037 | 0.2779 | 0.53 | 20001 | 20000 |
| TP[2,2] | 0.2847 | 0.05392 | 3.99E-04 | 0.1792 | 0.2846 | 0.3912 | 20001 | 20000 |
| TP[2,3] | 0.2813 | 0.07221 | 6.24E-04 | 0.142 | 0.281 | 0.4243 | 20001 | 20000 |
| TP[2,4] | 0.1459 | 0.08407 | 7.72E-04 | 0.03057 | 0.1302 | 0.3501 | 20001 | 20000 |
| d[2] | -0.4775 | 0.243 | 2.90E-03 | -0.962 | -0.4758 | -0.00214 | 20001 | 20000 |
| totresdev | 9.284 | 3.148 | 2.38E-02 | 5.137 | 8.657 | 17.07 | 20001 | 20000 |
| z[2] | 0.7853 | 0.132 | 8.89E-04 | 0.5448 | 0.78 | 1.059 | 20001 | 20000 |
| z[3] | 1.719 | 0.203 | 1.31E-03 | 1.34 | 1.712 | 2.134 | 20001 | 20000 |

**Table 6: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.644 | 37.705 | 4.939 | 47.583 |
| total | 42.644 | 37.705 | 4.939 | 47.58 |

### 3.2.3 Response

**Table 7: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.1793 | 0.3035 | 2.57E-03 | -77.45% | -0.1815 | 41.33% | 20001 | 20000 |
| T[1,1] | 0.5681 | 0.1143 | 9.67E-04 | 0.3398 | 0.572 | 0.7807 | 20001 | 20000 |
| T[1,2] | 0.7088 | 0.1328 | 1.50E-03 | 0.4138 | 0.7239 | 0.9209 | 20001 | 20000 |
| T[2,1] | 0.375 | 0.1179 | 9.62E-04 | 0.1641 | 0.3696 | 0.6165 | 20001 | 20000 |
| T[2,2] | 0.5296 | 0.1568 | 1.77E-03 | 0.2217 | 0.5327 | 0.8197 | 20001 | 20000 |
| T[3,1] | 0.1357 | 0.07416 | 5.86E-04 | 0.03222 | 0.1225 | 0.3174 | 20001 | 20000 |
| T[3,2] | 0.2464 | 0.1292 | 1.37E-03 | 0.0535 | 0.2283 | 0.5467 | 20001 | 20000 |
| TP[1,1] | 0.4319 | 0.1143 | 9.67E-04 | 0.2193 | 0.428 | 0.6603 | 20001 | 20000 |
| TP[1,2] | 0.193 | 0.04352 | 3.26E-04 | 0.1149 | 0.1912 | 0.2846 | 20001 | 20000 |
| TP[1,3] | 0.2393 | 0.06105 | 4.85E-04 | 0.1219 | 0.2393 | 0.3601 | 20001 | 20000 |
| TP[1,4] | 0.1357 | 0.07416 | 5.86E-04 | 0.03222 | 0.1225 | 0.3174 | 20001 | 20000 |
| TP[2,1] | 0.2912 | 0.1328 | 1.50E-03 | 0.07917 | 0.2761 | 0.5862 | 20001 | 20000 |
| TP[2,2] | 0.1792 | 0.04992 | 4.22E-04 | 0.08518 | 0.1781 | 0.2829 | 20001 | 20000 |
| TP[2,3] | 0.2832 | 0.06224 | 5.90E-04 | 0.1544 | 0.2844 | 0.4019 | 20001 | 20000 |
| TP[2,4] | 0.2464 | 0.1292 | 1.37E-03 | 0.0535 | 0.2283 | 0.5467 | 20001 | 20000 |
| d[2] | -0.4156 | 0.2796 | 3.97E-03 | -0.9599 | -0.4172 | 0.1352 | 20001 | 20000 |
| totresdev | 8.752 | 3.114 | 2.61E-02 | 4.639 | 8.118 | 16.49 | 20001 | 20000 |
| z[2] | 0.5144 | 0.1164 | 8.60E-04 | 0.3098 | 0.5078 | 0.7612 | 20001 | 20000 |
| z[3] | 1.344 | 0.1721 | 1.24E-03 | 1.022 | 1.339 | 1.697 | 20001 | 20000 |

**Table 8: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.434 | 37.521 | 4.913 | 47.347 |
| total | 42.434 | 37.521 | 4.913 | 47.347 |

### 3.2.4 High Response

**Table 9: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6736 | 0.3314 | 2.46E-03 | -132.50% | -0.672 | -2.84% | 20001 | 20000 |
| T[1,1] | 0.7387 | 0.1032 | 7.69E-04 | 0.5113 | 0.7492 | 0.9074 | 20001 | 20000 |
| T[1,2] | 0.79 | 0.1264 | 1.32E-03 | 0.4857 | 0.8141 | 0.9649 | 20001 | 20000 |
| T[2,1] | 0.6627 | 0.1215 | 9.04E-04 | 0.4016 | 0.6727 | 0.8717 | 20001 | 20000 |
| T[2,2] | 0.7248 | 0.1476 | 1.53E-03 | 0.3881 | 0.7458 | 0.9459 | 20001 | 20000 |
| T[3,1] | 0.453 | 0.1396 | 1.04E-03 | 0.1947 | 0.4508 | 0.7297 | 20001 | 20000 |
| T[3,2] | 0.5327 | 0.1784 | 1.87E-03 | 0.1866 | 0.5376 | 0.8593 | 20001 | 20000 |
| TP[1,1] | 0.2613 | 0.1032 | 7.69E-04 | 0.09261 | 0.2508 | 0.4887 | 20001 | 20000 |
| TP[1,2] | 0.07603 | 0.04104 | 3.01E-04 | 0.01785 | 0.06897 | 0.1746 | 20001 | 20000 |
| TP[1,3] | 0.2096 | 0.05638 | 3.91E-04 | 0.1075 | 0.2066 | 0.3277 | 20001 | 20000 |
| TP[1,4] | 0.453 | 0.1396 | 1.04E-03 | 0.1947 | 0.4508 | 0.7297 | 20001 | 20000 |
| TP[2,1] | 0.21 | 0.1264 | 1.32E-03 | 0.03509 | 0.1859 | 0.5143 | 20001 | 20000 |
| TP[2,2] | 0.06529 | 0.03973 | 3.30E-04 | 0.01156 | 0.05756 | 0.1618 | 20001 | 20000 |
| TP[2,3] | 0.1921 | 0.06239 | 5.02E-04 | 0.07527 | 0.1909 | 0.3184 | 20001 | 20000 |
| TP[2,4] | 0.5327 | 0.1784 | 1.87E-03 | 0.1866 | 0.5376 | 0.8593 | 20001 | 20000 |
| d[2] | -0.2179 | 0.3336 | 4.18E-03 | -0.8693 | -0.2225 | 0.4421 | 20001 | 20000 |
| totresdev | 13.07 | 3.181 | 2.41E-02 | 8.927 | 12.42 | 21.01 | 20001 | 20000 |
| z[2] | 0.2289 | 0.1098 | 7.85E-04 | 0.06429 | 0.2125 | 0.4849 | 20001 | 20000 |
| z[3] | 0.7998 | 0.1741 | 1.24E-03 | 0.4904 | 0.7908 | 1.161 | 20001 | 20000 |

**Table 10: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 37.511 | 32.741 | 4.77 | 42.28 |
| total | 37.511 | 32.741 | 4.77 | 42.28 |

## 3.3 Week 4-8

### 3.3.1 Non response

**Table 11: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.9866 | 0.1051 | 8.11E-04 | 77.86% | 0.9866 | 119.10% | 20001 | 20000 |
| T[1,1] | 0.1632 | 0.02583 | 1.98E-04 | 0.1169 | 0.1619 | 0.2181 | 20001 | 20000 |
| T[1,2] | 0.337 | 0.06518 | 6.07E-04 | 0.2176 | 0.3342 | 0.4719 | 20001 | 20000 |
| T[2,1] | 0.08637 | 0.01923 | 1.54E-04 | 0.05304 | 0.08484 | 0.128 | 20001 | 20000 |
| T[2,2] | 0.2118 | 0.05416 | 5.12E-04 | 0.1183 | 0.2073 | 0.3301 | 20001 | 20000 |
| T[3,1] | 0.03834 | 0.01194 | 9.04E-05 | 0.01896 | 0.03698 | 0.06552 | 20001 | 20000 |
| T[3,2] | 0.1141 | 0.03856 | 3.58E-04 | 0.05231 | 0.1099 | 0.2022 | 20001 | 20000 |
| TP[1,1] | 0.8368 | 0.02583 | 1.98E-04 | 0.7819 | 0.8381 | 0.8832 | 20001 | 20000 |
| TP[1,2] | 0.07687 | 0.01355 | 8.77E-05 | 0.05313 | 0.07594 | 0.1059 | 20001 | 20000 |
| TP[1,3] | 0.04802 | 0.01145 | 9.09E-05 | 0.02862 | 0.04696 | 0.07325 | 20001 | 20000 |
| TP[1,4] | 0.03834 | 0.01194 | 9.04E-05 | 0.01896 | 0.03698 | 0.06552 | 20001 | 20000 |
| TP[2,1] | 0.663 | 0.06518 | 6.07E-04 | 0.5281 | 0.6659 | 0.7825 | 20001 | 20000 |
| TP[2,2] | 0.1252 | 0.02299 | 1.64E-04 | 0.08414 | 0.1241 | 0.1736 | 20001 | 20000 |
| TP[2,3] | 0.09771 | 0.02443 | 2.05E-04 | 0.05566 | 0.09577 | 0.1497 | 20001 | 20000 |
| TP[2,4] | 0.1141 | 0.03856 | 3.58E-04 | 0.05231 | 0.1099 | 0.2022 | 20001 | 20000 |
| d[2] | -0.5593 | 0.1483 | 1.50E-03 | -0.8507 | -0.5569 | -0.2729 | 20001 | 20000 |
| totresdev | 8.031 | 3.166 | 2.55E-02 | 3.867 | 7.371 | 15.86 | 20001 | 20000 |
| z[2] | 0.387 | 0.06282 | 4.22E-04 | 0.2735 | 0.3841 | 0.5178 | 20001 | 20000 |
| z[3] | 0.8017 | 0.09743 | 6.93E-04 | 0.6211 | 0.7988 | 1.001 | 20001 | 20000 |

**Table 12: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 51.278 | 46.312 | 4.965 | 56.243 |
| total | 51.278 | 46.312 | 4.965 | 56.243 |

### 3.3.2 Partial response

**Table 13: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.4318 | 0.2591 | 1.98E-03 | -93.90% | -0.4322 | 7.84% | 20001 | 20000 |
| T[1,1] | 0.662 | 0.09197 | 6.98E-04 | 0.4689 | 0.6672 | 0.8262 | 20001 | 20000 |
| T[1,2] | 0.7172 | 0.1134 | 1.03E-03 | 0.4692 | 0.7278 | 0.9044 | 20001 | 20000 |
| T[2,1] | 0.3395 | 0.1031 | 7.91E-04 | 0.1573 | 0.3332 | 0.5554 | 20001 | 20000 |
| T[2,2] | 0.4061 | 0.1365 | 1.30E-03 | 0.1631 | 0.3991 | 0.6867 | 20001 | 20000 |
| T[3,1] | 0.1241 | 0.06341 | 4.69E-04 | 0.03259 | 0.1134 | 0.2763 | 20001 | 20000 |
| T[3,2] | 0.1681 | 0.09506 | 9.01E-04 | 0.03552 | 0.1505 | 0.3971 | 20001 | 20000 |
| TP[1,1] | 0.338 | 0.09197 | 6.98E-04 | 0.1739 | 0.3328 | 0.5313 | 20001 | 20000 |
| TP[1,2] | 0.3225 | 0.04967 | 3.59E-04 | 0.2265 | 0.322 | 0.4205 | 20001 | 20000 |
| TP[1,3] | 0.2154 | 0.05613 | 4.16E-04 | 0.1118 | 0.2137 | 0.3321 | 20001 | 20000 |
| TP[1,4] | 0.1241 | 0.06341 | 4.69E-04 | 0.03259 | 0.1134 | 0.2763 | 20001 | 20000 |
| TP[2,1] | 0.2828 | 0.1134 | 1.03E-03 | 0.09566 | 0.2722 | 0.5309 | 20001 | 20000 |
| TP[2,2] | 0.3111 | 0.05637 | 4.59E-04 | 0.1973 | 0.3121 | 0.4191 | 20001 | 20000 |
| TP[2,3] | 0.2379 | 0.06268 | 5.11E-04 | 0.1163 | 0.2381 | 0.3628 | 20001 | 20000 |
| TP[2,4] | 0.1681 | 0.09506 | 9.01E-04 | 0.03552 | 0.1505 | 0.3971 | 20001 | 20000 |
| d[2] | -0.1775 | 0.2394 | 2.71E-03 | -0.6534 | -0.1766 | 0.2916 | 20001 | 20000 |
| totresdev | 19.85 | 3.136 | 2.52E-02 | 15.71 | 19.21 | 27.61 | 20001 | 20000 |
| z[2] | 0.8631 | 0.1363 | 9.87E-04 | 0.6104 | 0.8581 | 1.142 | 20001 | 20000 |
| z[3] | 1.643 | 0.1821 | 1.29E-03 | 1.295 | 1.639 | 2.016 | 20001 | 20000 |

**Table 14: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 53.217 | 48.319 | 4.897 | 58.114 |
| total | 53.217 | 48.319 | 4.897 | 58.114 |

### 3.3.3 Response

**Table 15: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6136 | 0.2439 | 1.84E-03 | -109.40% | -0.6142 | -13.91% | 20001 | 20000 |
| T[1,1] | 0.7245 | 0.07949 | 5.92E-04 | 0.5554 | 0.7305 | 0.863 | 20001 | 20000 |
| T[1,2] | 0.7345 | 0.1047 | 9.10E-04 | 0.505 | 0.7457 | 0.9064 | 20001 | 20000 |
| T[2,1] | 0.646 | 0.09253 | 7.09E-04 | 0.4543 | 0.6504 | 0.8141 | 20001 | 20000 |
| T[2,2] | 0.6592 | 0.1191 | 1.07E-03 | 0.4118 | 0.6677 | 0.8663 | 20001 | 20000 |
| T[3,1] | 0.301 | 0.09553 | 7.42E-04 | 0.1353 | 0.2948 | 0.5047 | 20001 | 20000 |
| T[3,2] | 0.3207 | 0.1228 | 1.12E-03 | 0.1141 | 0.3108 | 0.5861 | 20001 | 20000 |
| TP[1,1] | 0.2755 | 0.07949 | 5.92E-04 | 0.137 | 0.2695 | 0.4447 | 20001 | 20000 |
| TP[1,2] | 0.07849 | 0.02964 | 2.27E-04 | 0.03157 | 0.07464 | 0.1463 | 20001 | 20000 |
| TP[1,3] | 0.345 | 0.04719 | 3.29E-04 | 0.2543 | 0.3448 | 0.4389 | 20001 | 20000 |
| TP[1,4] | 0.301 | 0.09553 | 7.42E-04 | 0.1353 | 0.2948 | 0.5047 | 20001 | 20000 |
| TP[2,1] | 0.2655 | 0.1047 | 9.10E-04 | 0.09366 | 0.2543 | 0.4952 | 20001 | 20000 |
| TP[2,2] | 0.07535 | 0.03001 | 2.45E-04 | 0.02788 | 0.0716 | 0.1436 | 20001 | 20000 |
| TP[2,3] | 0.3384 | 0.05062 | 3.37E-04 | 0.2374 | 0.3387 | 0.4376 | 20001 | 20000 |
| TP[2,4] | 0.3207 | 0.1228 | 1.12E-03 | 0.1141 | 0.3108 | 0.5861 | 20001 | 20000 |
| d[2] | -0.04709 | 0.2275 | 2.34E-03 | -0.4963 | -0.04605 | 0.3981 | 20001 | 20000 |
| totresdev | 14.9 | 3.175 | 2.63E-02 | 10.73 | 14.23 | 22.9 | 20001 | 20000 |
| z[2] | 0.2271 | 0.07703 | 5.74E-04 | 0.1003 | 0.2183 | 0.3994 | 20001 | 20000 |
| z[3] | 1.156 | 0.1451 | 1.08E-03 | 0.8827 | 1.151 | 1.453 | 20001 | 20000 |

**Table 16: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 48.767 | 43.903 | 4.864 | 53.631 |
| total | 48.767 | 43.903 | 4.864 | 53.631 |

### 3.3.4 High Response

**Table 17: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.4677 | 0.2647 | 1.99E-03 | -97.77% | -0.4668 | 5.07% | 20001 | 20000 |
| T[1,1] | 0.6744 | 0.09255 | 6.98E-04 | 0.4799 | 0.6797 | 0.836 | 20001 | 20000 |
| T[1,2] | 0.859 | 0.08321 | 7.83E-04 | 0.6554 | 0.8748 | 0.9722 | 20001 | 20000 |
| T[2,1] | 0.6017 | 0.1034 | 7.62E-04 | 0.3907 | 0.6059 | 0.7893 | 20001 | 20000 |
| T[2,2] | 0.8124 | 0.1005 | 9.53E-04 | 0.574 | 0.8289 | 0.9573 | 20001 | 20000 |
| T[3,1] | 0.4856 | 0.1117 | 8.26E-04 | 0.2699 | 0.4844 | 0.7006 | 20001 | 20000 |
| T[3,2] | 0.7261 | 0.1248 | 1.20E-03 | 0.4495 | 0.7403 | 0.9241 | 20001 | 20000 |
| TP[1,1] | 0.3256 | 0.09255 | 6.98E-04 | 0.1641 | 0.3203 | 0.5202 | 20001 | 20000 |
| TP[1,2] | 0.0727 | 0.03275 | 2.23E-04 | 0.02308 | 0.06814 | 0.1489 | 20001 | 20000 |
| TP[1,3] | 0.1161 | 0.03749 | 2.68E-04 | 0.05368 | 0.1126 | 0.1984 | 20001 | 20000 |
| TP[1,4] | 0.4856 | 0.1117 | 8.26E-04 | 0.2699 | 0.4844 | 0.7006 | 20001 | 20000 |
| TP[2,1] | 0.141 | 0.08321 | 7.83E-04 | 0.02782 | 0.1252 | 0.3447 | 20001 | 20000 |
| TP[2,2] | 0.04655 | 0.02759 | 2.23E-04 | 0.009329 | 0.04095 | 0.1134 | 20001 | 20000 |
| TP[2,3] | 0.08634 | 0.03804 | 3.24E-04 | 0.02633 | 0.08161 | 0.1717 | 20001 | 20000 |
| TP[2,4] | 0.7261 | 0.1248 | 1.20E-03 | 0.4495 | 0.7403 | 0.9241 | 20001 | 20000 |
| d[2] | -0.685 | 0.2815 | 3.24E-03 | -1.238 | -0.6871 | -0.1328 | 20001 | 20000 |
| totresdev | 13.01 | 3.101 | 2.58E-02 | 8.905 | 12.39 | 20.62 | 20001 | 20000 |
| z[2] | 0.2002 | 0.0854 | 5.88E-04 | 0.06738 | 0.1894 | 0.3965 | 20001 | 20000 |
| z[3] | 0.5054 | 0.124 | 8.57E-04 | 0.2866 | 0.4964 | 0.7686 | 20001 | 20000 |

**Table 18: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 40.392 | 35.667 | 4.725 | 45.117 |
| total | 40.392 | 35.667 | 4.725 | 45.117 |

## 3.4 Week 8-12

### 3.4.1 Non response

**Table 19: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.8427 | 0.1018 | 7.63E-04 | 64.25% | 0.8425 | 104.20% | 20001 | 20000 |
| T[1,1] | 0.2009 | 0.02846 | 2.14E-04 | 0.1486 | 0.1997 | 0.2604 | 20001 | 20000 |
| T[1,2] | 0.2194 | 0.05501 | 4.59E-04 | 0.1243 | 0.2152 | 0.3375 | 20001 | 20000 |
| T[2,1] | 0.1287 | 0.02426 | 1.86E-04 | 0.08549 | 0.1272 | 0.18 | 20001 | 20000 |
| T[2,2] | 0.1434 | 0.04387 | 3.65E-04 | 0.07119 | 0.139 | 0.241 | 20001 | 20000 |
| T[3,1] | 0.05472 | 0.01569 | 1.19E-04 | 0.02857 | 0.05312 | 0.0898 | 20001 | 20000 |
| T[3,2] | 0.06318 | 0.0261 | 2.17E-04 | 0.02438 | 0.0593 | 0.1257 | 20001 | 20000 |
| TP[1,1] | 0.7991 | 0.02846 | 2.14E-04 | 0.7397 | 0.8003 | 0.8514 | 20001 | 20000 |
| TP[1,2] | 0.07222 | 0.01372 | 1.06E-04 | 0.04773 | 0.07163 | 0.1011 | 20001 | 20000 |
| TP[1,3] | 0.07396 | 0.01533 | 1.17E-04 | 0.04699 | 0.07295 | 0.1071 | 20001 | 20000 |
| TP[1,4] | 0.05472 | 0.01569 | 1.19E-04 | 0.02857 | 0.05312 | 0.0898 | 20001 | 20000 |
| TP[2,1] | 0.7806 | 0.05501 | 4.59E-04 | 0.6625 | 0.7848 | 0.8758 | 20001 | 20000 |
| TP[2,2] | 0.07602 | 0.01818 | 1.49E-04 | 0.04425 | 0.0748 | 0.1151 | 20001 | 20000 |
| TP[2,3] | 0.08022 | 0.02308 | 1.85E-04 | 0.04145 | 0.07801 | 0.1315 | 20001 | 20000 |
| TP[2,4] | 0.06318 | 0.0261 | 2.17E-04 | 0.02438 | 0.0593 | 0.1257 | 20001 | 20000 |
| d[2] | -0.05499 | 0.1581 | 1.33E-03 | -0.3655 | -0.05422 | 0.2547 | 20001 | 20000 |
| totresdev | 12.67 | 3.156 | 2.43E-02 | 8.52 | 12.01 | 20.51 | 20001 | 20000 |
| z[2] | 0.2975 | 0.05608 | 4.45E-04 | 0.1969 | 0.295 | 0.4166 | 20001 | 20000 |
| z[3] | 0.7741 | 0.1002 | 7.27E-04 | 0.5894 | 0.7709 | 0.9789 | 20001 | 20000 |

**Table 20: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 53.73 | 48.799 | 4.931 | 58.66 |
| total | 53.73 | 48.799 | 4.931 | 58.66 |

### 3.4.2 Partial response

**Table 21: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.08649 | 0.2504 | 1.90E-03 | -57.98% | -0.08635 | 40.05% | 20001 | 20000 |
| T[1,1] | 0.5334 | 0.09658 | 7.33E-04 | 0.3445 | 0.5344 | 0.719 | 20001 | 20000 |
| T[1,2] | 0.6463 | 0.127 | 1.18E-03 | 0.3799 | 0.6542 | 0.8651 | 20001 | 20000 |
| T[2,1] | 0.2658 | 0.09145 | 6.84E-04 | 0.1113 | 0.2578 | 0.4673 | 20001 | 20000 |
| T[2,2] | 0.3759 | 0.1358 | 1.27E-03 | 0.1398 | 0.3675 | 0.6574 | 20001 | 20000 |
| T[3,1] | 0.07153 | 0.04461 | 3.30E-04 | 0.01452 | 0.06156 | 0.1843 | 20001 | 20000 |
| T[3,2] | 0.128 | 0.08349 | 7.71E-04 | 0.0214 | 0.1095 | 0.3354 | 20001 | 20000 |
| TP[1,1] | 0.4666 | 0.09658 | 7.33E-04 | 0.281 | 0.4656 | 0.6556 | 20001 | 20000 |
| TP[1,2] | 0.2677 | 0.04977 | 3.84E-04 | 0.1762 | 0.2655 | 0.3696 | 20001 | 20000 |
| TP[1,3] | 0.1942 | 0.05992 | 4.45E-04 | 0.08854 | 0.1906 | 0.3215 | 20001 | 20000 |
| TP[1,4] | 0.07153 | 0.04461 | 3.30E-04 | 0.01452 | 0.06156 | 0.1843 | 20001 | 20000 |
| TP[2,1] | 0.3537 | 0.127 | 1.18E-03 | 0.135 | 0.3458 | 0.6201 | 20001 | 20000 |
| TP[2,2] | 0.2704 | 0.0552 | 4.30E-04 | 0.1666 | 0.2692 | 0.3808 | 20001 | 20000 |
| TP[2,3] | 0.2479 | 0.07364 | 6.33E-04 | 0.1092 | 0.2473 | 0.394 | 20001 | 20000 |
| TP[2,4] | 0.128 | 0.08349 | 7.71E-04 | 0.0214 | 0.1095 | 0.3354 | 20001 | 20000 |
| d[2] | -0.3126 | 0.2629 | 2.83E-03 | -0.8292 | -0.3139 | 0.194 | 20001 | 20000 |
| totresdev | 15.27 | 3.151 | 2.18E-02 | 11.12 | 14.63 | 23.03 | 20001 | 20000 |
| z[2] | 0.7377 | 0.1435 | 1.05E-03 | 0.4784 | 0.7298 | 1.037 | 20001 | 20000 |
| z[3] | 1.627 | 0.2101 | 1.60E-03 | 1.233 | 1.622 | 2.054 | 20001 | 20000 |

**Table 22: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 47.944 | 42.972 | 4.972 | 52.916 |
| total | 47.944 | 42.972 | 4.972 | 52.916 |

### 3.4.3 Response

**Table 23: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.7291 | 0.2766 | 1.90E-03 | -127.30% | -0.7289 | -18.89% | 20001 | 20000 |
| T[1,1] | 0.7589 | 0.08367 | 5.81E-04 | 0.575 | 0.767 | 0.8985 | 20001 | 20000 |
| T[1,2] | 0.8092 | 0.09623 | 8.12E-04 | 0.5843 | 0.8246 | 0.9508 | 20001 | 20000 |
| T[2,1] | 0.6758 | 0.1014 | 7.05E-04 | 0.4581 | 0.6827 | 0.8522 | 20001 | 20000 |
| T[2,2] | 0.737 | 0.1176 | 1.02E-03 | 0.4732 | 0.7517 | 0.9218 | 20001 | 20000 |
| T[3,1] | 0.3104 | 0.1088 | 7.82E-04 | 0.1245 | 0.3027 | 0.542 | 20001 | 20000 |
| T[3,2] | 0.3846 | 0.1429 | 1.33E-03 | 0.1352 | 0.3757 | 0.6802 | 20001 | 20000 |
| TP[1,1] | 0.2411 | 0.08367 | 5.81E-04 | 0.1015 | 0.233 | 0.4251 | 20001 | 20000 |
| TP[1,2] | 0.08307 | 0.03487 | 2.64E-04 | 0.02939 | 0.07843 | 0.1637 | 20001 | 20000 |
| TP[1,3] | 0.3654 | 0.0531 | 3.68E-04 | 0.2612 | 0.3651 | 0.469 | 20001 | 20000 |
| TP[1,4] | 0.3104 | 0.1088 | 7.82E-04 | 0.1245 | 0.3027 | 0.542 | 20001 | 20000 |
| TP[2,1] | 0.1908 | 0.09623 | 8.12E-04 | 0.04917 | 0.1754 | 0.4157 | 20001 | 20000 |
| TP[2,2] | 0.07216 | 0.03475 | 2.96E-04 | 0.02039 | 0.0668 | 0.1545 | 20001 | 20000 |
| TP[2,3] | 0.3525 | 0.06157 | 4.87E-04 | 0.2217 | 0.3544 | 0.4683 | 20001 | 20000 |
| TP[2,4] | 0.3846 | 0.1429 | 1.33E-03 | 0.1352 | 0.3757 | 0.6802 | 20001 | 20000 |
| d[2] | -0.2035 | 0.2471 | 2.70E-03 | -0.6821 | -0.2005 | 0.2863 | 20001 | 20000 |
| totresdev | 8.117 | 3.14 | 2.60E-02 | 3.989 | 7.487 | 15.93 | 20001 | 20000 |
| z[2] | 0.2541 | 0.0918 | 7.09E-04 | 0.1041 | 0.2446 | 0.4618 | 20001 | 20000 |
| z[3] | 1.249 | 0.163 | 1.19E-03 | 0.9452 | 1.245 | 1.582 | 20001 | 20000 |

**Table 24: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 41.936 | 37.081 | 4.855 | 46.791 |
| total | 41.936 | 37.081 | 4.855 | 46.791 |

### 3.4.4 High Response

**Table 25: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.7082 | 0.2309 | 1.75E-03 | -116.20% | -0.7079 | -25.84% | 20001 | 20000 |
| T[1,1] | 0.7549 | 0.07118 | 5.43E-04 | 0.602 | 0.7605 | 0.8776 | 20001 | 20000 |
| T[1,2] | 0.8738 | 0.06431 | 6.06E-04 | 0.7191 | 0.8856 | 0.9656 | 20001 | 20000 |
| T[2,1] | 0.6782 | 0.08556 | 6.48E-04 | 0.4978 | 0.683 | 0.8311 | 20001 | 20000 |
| T[2,2] | 0.8215 | 0.08244 | 7.87E-04 | 0.6303 | 0.8343 | 0.9451 | 20001 | 20000 |
| T[3,1] | 0.4329 | 0.1007 | 7.57E-04 | 0.2421 | 0.4309 | 0.6328 | 20001 | 20000 |
| T[3,2] | 0.6183 | 0.1221 | 1.18E-03 | 0.3692 | 0.6248 | 0.8341 | 20001 | 20000 |
| TP[1,1] | 0.2451 | 0.07118 | 5.43E-04 | 0.1225 | 0.2395 | 0.3981 | 20001 | 20000 |
| TP[1,2] | 0.07673 | 0.02965 | 2.20E-04 | 0.03006 | 0.07292 | 0.1443 | 20001 | 20000 |
| TP[1,3] | 0.2453 | 0.0422 | 3.08E-04 | 0.1653 | 0.2445 | 0.3293 | 20001 | 20000 |
| TP[1,4] | 0.4329 | 0.1007 | 7.57E-04 | 0.2421 | 0.4309 | 0.6328 | 20001 | 20000 |
| TP[2,1] | 0.1262 | 0.06431 | 6.06E-04 | 0.03447 | 0.1144 | 0.281 | 20001 | 20000 |
| TP[2,2] | 0.05232 | 0.02607 | 2.25E-04 | 0.01518 | 0.04796 | 0.114 | 20001 | 20000 |
| TP[2,3] | 0.2032 | 0.05279 | 4.69E-04 | 0.1015 | 0.2026 | 0.3072 | 20001 | 20000 |
| TP[2,4] | 0.6183 | 0.1221 | 1.18E-03 | 0.3692 | 0.6248 | 0.8341 | 20001 | 20000 |
| d[2] | -0.4924 | 0.2149 | 2.45E-03 | -0.9133 | -0.4928 | -0.06945 | 20001 | 20000 |
| totresdev | 10.33 | 3.124 | 2.35E-02 | 6.182 | 9.727 | 17.99 | 20001 | 20000 |
| z[2] | 0.232 | 0.07866 | 5.74E-04 | 0.103 | 0.2239 | 0.4073 | 20001 | 20000 |
| z[3] | 0.8832 | 0.1267 | 9.58E-04 | 0.6478 | 0.8788 | 1.143 | 20001 | 20000 |

**Table 26: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 44.698 | 39.815 | 4.883 | 49.58 |
| total | 44.698 | 39.815 | 4.883 | 49.58 |

## 3.5 Week 12-36

### 3.5.1 Non response

**Table 27: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 1.614 | 0.2362 | 0.001645 | 1.153 | 1.614 | 2.075 | 20001 | 20000 |
| T[1,1] | 0.05809 | 0.02759 | 1.92E-04 | 0.01899 | 0.05322 | 0.1245 | 20001 | 20000 |
| T[1,2] | 0.2442 | 0.126 | 0.00136 | 0.05524 | 0.2257 | 0.5361 | 20001 | 20000 |
| T[1,3] | 0.2961 | 0.1364 | 0.001404 | 0.07858 | 0.2805 | 0.5987 | 20001 | 20000 |
| T[2,1] | 0.04138 | 0.02203 | 1.54E-04 | 0.01162 | 0.03698 | 0.0958 | 20001 | 20000 |
| T[2,2] | 0.1976 | 0.1133 | 0.001214 | 0.03842 | 0.1777 | 0.4725 | 20001 | 20000 |
| T[2,3] | 0.244 | 0.1254 | 0.001275 | 0.05468 | 0.2253 | 0.5317 | 20001 | 20000 |
| T[3,1] | 0.01728 | 0.01179 | 8.30E-05 | 0.003287 | 0.01441 | 0.0471 | 20001 | 20000 |
| T[3,2] | 0.1125 | 0.08235 | 8.68E-04 | 0.01384 | 0.09255 | 0.3273 | 20001 | 20000 |
| T[3,3] | 0.1451 | 0.09572 | 9.68E-04 | 0.02135 | 0.124 | 0.3834 | 20001 | 20000 |
| TP[1,1] | 0.9419 | 0.02759 | 1.92E-04 | 0.8755 | 0.9468 | 0.981 | 20001 | 20000 |
| TP[1,2] | 0.01671 | 0.008917 | 6.10E-05 | 0.004627 | 0.015 | 0.03885 | 20001 | 20000 |
| TP[1,3] | 0.0241 | 0.0125 | 8.58E-05 | 0.007095 | 0.02178 | 0.05469 | 20001 | 20000 |
| TP[1,4] | 0.01728 | 0.01179 | 8.30E-05 | 0.003287 | 0.01441 | 0.0471 | 20001 | 20000 |
| TP[2,1] | 0.7558 | 0.126 | 0.00136 | 0.464 | 0.7743 | 0.9448 | 20001 | 20000 |
| TP[2,2] | 0.04659 | 0.02359 | 2.02E-04 | 0.01183 | 0.04306 | 0.1025 | 20001 | 20000 |
| TP[2,3] | 0.08503 | 0.04125 | 3.98E-04 | 0.0211 | 0.07977 | 0.1784 | 20001 | 20000 |
| TP[2,4] | 0.1125 | 0.08235 | 8.68E-04 | 0.01384 | 0.09255 | 0.3273 | 20001 | 20000 |
| TP[3,1] | 0.7039 | 0.1364 | 0.001404 | 0.4014 | 0.7195 | 0.9217 | 20001 | 20000 |
| TP[3,2] | 0.05207 | 0.02451 | 1.98E-04 | 0.01457 | 0.04854 | 0.1091 | 20001 | 20000 |
| TP[3,3] | 0.09895 | 0.04308 | 3.77E-04 | 0.02826 | 0.09445 | 0.1956 | 20001 | 20000 |
| TP[3,4] | 0.1451 | 0.09572 | 9.68E-04 | 0.02135 | 0.124 | 0.3834 | 20001 | 20000 |
| d[2] | -0.8605 | 0.3577 | 0.004276 | -1.572 | -0.8601 | -0.1531 | 20001 | 20000 |
| d[3] | -1.032 | 0.3533 | 0.003958 | -1.728 | -1.032 | -0.3391 | 20001 | 20000 |
| totresdev | 12.51 | 3.48 | 0.02692 | 7.727 | 11.82 | 21.05 | 20001 | 20000 |
| z[2] | 0.1722 | 0.06845 | 4.47E-04 | 0.06451 | 0.1633 | 0.3312 | 20001 | 20000 |
| z[3] | 0.5737 | 0.1285 | 8.21E-04 | 0.3485 | 0.5647 | 0.8506 | 20001 | 20000 |

**Table 28: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 45.914 | 40.107 | 5.807 | 51.721 |
| total | 45.914 | 40.107 | 5.807 | 51.721 |

### 3.5.2 Partial response

**Table 29: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.2917 | 0.4051 | 0.003849 | -0.5086 | 0.2931 | 1.084 | 10001 | 10000 |
| T[1,1] | 0.3934 | 0.1452 | 1.38E-03 | 0.1393 | 0.3848 | 0.6946 | 10001 | 10000 |
| T[1,2] | 0.7103 | 0.1903 | 0.002503 | 0.2704 | 0.742 | 0.9741 | 10001 | 10000 |
| T[1,3] | 0.1934 | 0.1678 | 0.002167 | 0.006894 | 0.1453 | 0.6308 | 10001 | 10000 |
| T[2,1] | 0.2826 | 0.1367 | 1.33E-03 | 0.06948 | 0.2655 | 0.5848 | 10001 | 10000 |
| T[2,2] | 0.6069 | 0.2125 | 0.002721 | 0.1697 | 0.6239 | 0.9488 | 10001 | 10000 |
| T[2,3] | 0.1296 | 0.1376 | 0.001694 | 0.002382 | 0.08146 | 0.5122 | 10001 | 10000 |
| T[3,1] | 0.1496 | 0.1033 | 1.05E-03 | 0.01795 | 0.1266 | 0.4124 | 10001 | 10000 |
| T[3,2] | 0.4348 | 0.2208 | 2.75E-03 | 0.07035 | 0.4206 | 0.8714 | 10001 | 10000 |
| T[3,3] | 0.06355 | 0.09134 | 1.13E-03 | 3.20E-04 | 0.02819 | 0.3331 | 10001 | 10000 |
| TP[1,1] | 0.6066 | 0.1452 | 1.38E-03 | 0.3055 | 0.6153 | 0.8607 | 10001 | 10000 |
| TP[1,2] | 0.1108 | 0.05226 | 5.07E-04 | 0.03192 | 0.1036 | 0.2302 | 10001 | 10000 |
| TP[1,3] | 0.133 | 0.06262 | 6.07E-04 | 0.03634 | 0.125 | 0.2753 | 10001 | 10000 |
| TP[1,4] | 0.1496 | 0.1033 | 1.05E-03 | 0.01795 | 0.1266 | 0.4124 | 10001 | 10000 |
| TP[2,1] | 0.2897 | 0.1903 | 0.002503 | 0.02587 | 0.2581 | 0.73 | 10001 | 10000 |
| TP[2,2] | 0.1034 | 0.05866 | 5.44E-04 | 0.01675 | 0.09462 | 0.2405 | 10001 | 10000 |
| TP[2,3] | 0.172 | 0.07648 | 8.40E-04 | 0.04669 | 0.1636 | 0.3448 | 10001 | 10000 |
| TP[2,4] | 0.4348 | 0.2208 | 2.75E-03 | 0.07035 | 0.4206 | 0.8714 | 10001 | 10000 |
| TP[3,1] | 0.8066 | 0.1678 | 0.002167 | 0.3706 | 0.8548 | 0.9931 | 10001 | 10000 |
| TP[3,2] | 0.06384 | 0.04862 | 6.11E-04 | 0.003701 | 0.05296 | 0.1856 | 10001 | 10000 |
| TP[3,3] | 0.06603 | 0.05927 | 6.90E-04 | 0.001847 | 0.04917 | 0.2169 | 10001 | 10000 |
| TP[3,4] | 0.06355 | 0.09134 | 1.13E-03 | 3.20E-04 | 0.02819 | 0.3331 | 10001 | 10000 |
| d[2] | -0.9532 | 0.5105 | 0.007966 | -1.957 | -0.9596 | 0.07111 | 10001 | 10000 |
| d[3] | 0.7656 | 0.5816 | 0.00895 | -0.3631 | 0.7602 | 1.921 | 10001 | 10000 |
| totresdev | 13.28 | 3.407 | 0.03706 | 8.643 | 12.63 | 21.51 | 10001 | 10000 |
| z[2] | 0.3355 | 0.1554 | 1.50E-03 | 0.09778 | 0.3135 | 0.6949 | 10001 | 10000 |
| z[3] | 0.8562 | 0.2432 | 2.76E-03 | 0.4359 | 0.838 | 1.381 | 10001 | 10000 |

**Table 30: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 33.087 | 27.449 | 5.638 | 38.725 |
| total | 33.087 | 27.449 | 5.638 | 38.725 |

### 3.5.3 Response

**Table 31: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.5649 | 0.3158 | 0.002176 | -0.05552 | 0.5675 | 1.178 | 20001 | 20000 |
| T[1,1] | 0.295 | 0.1048 | 7.30E-04 | 0.1193 | 0.2852 | 0.5222 | 20001 | 20000 |
| T[1,2] | 0.4779 | 0.1797 | 0.001895 | 0.1465 | 0.4741 | 0.8242 | 20001 | 20000 |
| T[1,3] | 0.4936 | 0.1884 | 0.001979 | 0.1414 | 0.4902 | 0.8515 | 20001 | 20000 |
| T[2,1] | 0.2688 | 0.1021 | 7.03E-04 | 0.102 | 0.2575 | 0.4955 | 20001 | 20000 |
| T[2,2] | 0.4486 | 0.1791 | 0.001873 | 0.1291 | 0.4419 | 0.8036 | 20001 | 20000 |
| T[2,3] | 0.4647 | 0.1885 | 0.00198 | 0.1231 | 0.4582 | 0.832 | 20001 | 20000 |
| T[3,1] | 0.1389 | 0.07514 | 5.33E-04 | 0.03254 | 0.1256 | 0.3193 | 20001 | 20000 |
| T[3,2] | 0.2831 | 0.1595 | 1.61E-03 | 0.04755 | 0.2583 | 0.6484 | 20001 | 20000 |
| T[3,3] | 0.2987 | 0.1703 | 1.75E-03 | 4.61E-02 | 0.272 | 0.6834 | 20001 | 20000 |
| TP[1,1] | 0.705 | 0.1048 | 7.30E-04 | 0.4779 | 0.7148 | 0.8807 | 20001 | 20000 |
| TP[1,2] | 0.02621 | 0.01861 | 1.29E-04 | 0.003103 | 0.02189 | 0.07261 | 20001 | 20000 |
| TP[1,3] | 0.1299 | 0.04527 | 3.04E-04 | 0.05434 | 0.1255 | 0.2312 | 20001 | 20000 |
| TP[1,4] | 0.1389 | 0.07514 | 5.33E-04 | 0.03254 | 0.1256 | 0.3193 | 20001 | 20000 |
| TP[2,1] | 0.5221 | 0.1797 | 0.001895 | 0.1759 | 0.5259 | 0.8535 | 20001 | 20000 |
| TP[2,2] | 0.02926 | 0.02108 | 1.42E-04 | 0.003379 | 0.02437 | 0.08275 | 20001 | 20000 |
| TP[2,3] | 0.1655 | 0.05516 | 4.52E-04 | 0.06646 | 0.1622 | 0.2827 | 20001 | 20000 |
| TP[2,4] | 0.2831 | 0.1595 | 1.61E-03 | 0.04755 | 0.2583 | 0.6484 | 20001 | 20000 |
| TP[3,1] | 0.5064 | 0.1884 | 0.001979 | 0.1487 | 0.5098 | 0.8586 | 20001 | 20000 |
| TP[3,2] | 0.02896 | 0.02097 | 1.44E-04 | 0.003296 | 0.02395 | 0.08249 | 20001 | 20000 |
| TP[3,3] | 0.166 | 0.05594 | 4.56E-04 | 0.06356 | 0.1634 | 0.2844 | 20001 | 20000 |
| TP[3,4] | 0.2987 | 0.1703 | 1.75E-03 | 4.61E-02 | 0.272 | 0.6834 | 20001 | 20000 |
| d[2] | -0.5031 | 0.3943 | 0.00465 | -1.275 | -0.5024 | 0.2664 | 20001 | 20000 |
| d[3] | -0.5471 | 0.4305 | 0.004977 | -1.394 | -0.5454 | 0.295 | 20001 | 20000 |
| totresdev | 11.99 | 3.539 | 0.02691 | 7.181 | 11.31 | 20.63 | 20001 | 20000 |
| z[2] | 0.08243 | 0.05753 | 3.91E-04 | 0.009993 | 0.06969 | 0.2288 | 20001 | 20000 |
| z[3] | 0.5846 | 0.1484 | 1.06E-03 | 0.3252 | 0.5732 | 0.9054 | 20001 | 20000 |

**Table 32: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 38.19 | 32.693 | 5.497 | 43.688 |
| total | 38.19 | 32.693 | 5.497 | 43.688 |

### 3.5.4 High Response

**Table 33: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.1651 | 0.2889 | 0.001933 | -0.3999 | 0.1644 | 0.7375 | 20001 | 20000 |
| T[1,1] | 0.437 | 0.1094 | 7.30E-04 | 0.2305 | 0.4347 | 0.6554 | 20001 | 20000 |
| T[1,2] | 0.5493 | 0.1662 | 0.001665 | 0.2181 | 0.5543 | 0.848 | 20001 | 20000 |
| T[1,3] | 0.2793 | 0.1412 | 0.001476 | 0.06146 | 0.2611 | 0.5937 | 20001 | 20000 |
| T[2,1] | 0.4028 | 0.1091 | 7.14E-04 | 0.2023 | 0.3991 | 0.6227 | 20001 | 20000 |
| T[2,2] | 0.5162 | 0.168 | 0.001679 | 0.1929 | 0.5185 | 0.8265 | 20001 | 20000 |
| T[2,3] | 0.2523 | 0.1355 | 0.001403 | 0.04957 | 0.2319 | 0.5621 | 20001 | 20000 |
| T[3,1] | 0.3236 | 0.1047 | 7.11E-04 | 0.1389 | 0.3165 | 0.5444 | 20001 | 20000 |
| T[3,2] | 0.4363 | 0.1678 | 1.68E-03 | 0.1362 | 0.4309 | 0.7664 | 20001 | 20000 |
| T[3,3] | 0.1933 | 0.1197 | 1.23E-03 | 2.98E-02 | 0.1704 | 0.4792 | 20001 | 20000 |
| TP[1,1] | 0.563 | 0.1094 | 7.30E-04 | 0.3446 | 0.5653 | 0.7696 | 20001 | 20000 |
| TP[1,2] | 0.03423 | 0.0194 | 1.42E-04 | 0.00719 | 0.03067 | 0.08147 | 20001 | 20000 |
| TP[1,3] | 0.07919 | 0.02911 | 1.89E-04 | 0.03244 | 0.07577 | 0.1463 | 20001 | 20000 |
| TP[1,4] | 0.3236 | 0.1047 | 7.11E-04 | 0.1389 | 0.3165 | 0.5444 | 20001 | 20000 |
| TP[2,1] | 0.4507 | 0.1662 | 0.001665 | 0.152 | 0.4457 | 0.7819 | 20001 | 20000 |
| TP[2,2] | 0.03307 | 0.01941 | 1.42E-04 | 0.006502 | 0.02935 | 0.08093 | 20001 | 20000 |
| TP[2,3] | 0.07986 | 0.03068 | 2.12E-04 | 0.03077 | 0.07634 | 0.15 | 20001 | 20000 |
| TP[2,4] | 0.4363 | 0.1678 | 1.68E-03 | 0.1362 | 0.4309 | 0.7664 | 20001 | 20000 |
| TP[3,1] | 0.7207 | 0.1412 | 0.001476 | 0.4066 | 0.739 | 0.9386 | 20001 | 20000 |
| TP[3,2] | 0.02699 | 0.01706 | 1.39E-04 | 0.004617 | 0.02349 | 0.06921 | 20001 | 20000 |
| TP[3,3] | 0.05904 | 0.02836 | 2.37E-04 | 0.01541 | 0.05539 | 0.1252 | 20001 | 20000 |
| TP[3,4] | 0.1933 | 0.1197 | 1.23E-03 | 2.98E-02 | 0.1704 | 0.4792 | 20001 | 20000 |
| d[2] | -0.301 | 0.3617 | 0.004122 | -1.011 | -0.304 | 0.4028 | 20001 | 20000 |
| d[3] | 0.4779 | 0.3564 | 0.004248 | -0.2152 | 0.4747 | 1.177 | 20001 | 20000 |
| totresdev | 13.82 | 3.482 | 0.0254 | 8.995 | 13.2 | 22.17 | 20001 | 20000 |
| z[2] | 0.09153 | 0.05189 | 3.75E-04 | 0.01925 | 0.08203 | 0.2186 | 20001 | 20000 |
| z[3] | 0.3134 | 0.09406 | 6.71E-04 | 0.1549 | 0.3043 | 0.5222 | 20001 | 20000 |

**Table 34: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 41.371 | 35.744 | 5.627 | 46.997 |
| total | 41.371 | 35.744 | 5.627 | 46.997 |

# 4. Random-effects models

## 4.1 Week 0-2

### 4.1.1 Non-response

**Table 35: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.7284 | 0.08027 | 6.19E-04 | 57.03% | 0.7282 | 88.53% | 20001 | 20000 |
| T[1,1] | 0.2339 | 0.02456 | 1.89E-04 | 0.188 | 0.2333 | 0.2842 | 20001 | 20000 |
| T[1,2] | 0.4896 | 0.1145 | 8.49E-04 | 0.2538 | 0.49 | 0.7228 | 20001 | 20000 |
| T[2,1] | 0.1209 | 0.01834 | 1.36E-04 | 0.08771 | 0.12 | 0.1592 | 20001 | 20000 |
| T[2,2] | 0.325 | 0.105 | 7.85E-04 | 0.1323 | 0.3186 | 0.5571 | 20001 | 20000 |
| T[3,1] | 0.03932 | 0.008986 | 6.71E-05 | 0.02417 | 0.03854 | 0.05921 | 20001 | 20000 |
| T[3,2] | 0.1539 | 0.073 | 5.42E-04 | 0.04356 | 0.1434 | 0.3293 | 20001 | 20000 |
| TP[1,1] | 0.7661 | 0.02456 | 1.89E-04 | 0.7158 | 0.7668 | 0.812 | 20001 | 20000 |
| TP[1,2] | 0.113 | 0.01219 | 8.74E-05 | 0.09046 | 0.1126 | 0.1382 | 20001 | 20000 |
| TP[1,3] | 0.08155 | 0.01198 | 9.09E-05 | 0.05986 | 0.08098 | 0.1065 | 20001 | 20000 |
| TP[1,4] | 0.03932 | 0.008986 | 6.71E-05 | 0.02417 | 0.03854 | 0.05921 | 20001 | 20000 |
| TP[2,1] | 0.5104 | 0.1145 | 8.49E-04 | 0.2775 | 0.51 | 0.7463 | 20001 | 20000 |
| TP[2,2] | 0.1646 | 0.02216 | 1.41E-04 | 0.115 | 0.1661 | 0.2043 | 20001 | 20000 |
| TP[2,3] | 0.1711 | 0.03856 | 2.89E-04 | 0.0869 | 0.173 | 0.2411 | 20001 | 20000 |
| TP[2,4] | 0.1539 | 0.073 | 5.42E-04 | 0.04356 | 0.1434 | 0.3293 | 20001 | 20000 |
| d[2] | -0.7012 | 0.2964 | 2.14E-03 | -1.301 | -0.7036 | -0.07954 | 20001 | 20000 |
| sd | 0.3561 | 0.1714 | 1.30E-03 | 0.09048 | 0.3295 | 0.7613 | 20001 | 20000 |
| totresdev | 15.74 | 3.744 | 3.38E-02 | 10.61 | 15.03 | 24.74 | 20001 | 20000 |
| z[2] | 0.4471 | 0.04372 | 2.88E-04 | 0.3657 | 0.4454 | 0.536 | 20001 | 20000 |
| z[3] | 1.04 | 0.06899 | 5.08E-04 | 0.9076 | 1.039 | 1.18 | 20001 | 20000 |

**Table 36: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 70.291 | 64.23 | 6.061 | 76.352 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 71.677 | 65.616 | 6.061 | 77.738 |

## 4.2 Week 2-4

### 4.2.1 Non response

**Table 37: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.8202 | 0.09402 | 6.88E-04 | 63.54% | 0.8199 | 100.60% | 20001 | 20000 |
| T[1,1] | 0.2071 | 0.0268 | 1.96E-04 | 0.1573 | 0.2061 | 0.2626 | 20001 | 20000 |
| T[1,2] | 0.3784 | 0.08683 | 7.94E-04 | 0.2148 | 0.3753 | 0.5646 | 20001 | 20000 |
| T[2,1] | 0.1098 | 0.02053 | 1.55E-04 | 0.07337 | 0.1086 | 0.1537 | 20001 | 20000 |
| T[2,2] | 0.238 | 0.07313 | 6.62E-04 | 0.1135 | 0.2321 | 0.4041 | 20001 | 20000 |
| T[3,1] | 0.03185 | 0.009735 | 7.35E-05 | 0.0159 | 0.03074 | 0.0537 | 20001 | 20000 |
| T[3,2] | 0.09214 | 0.04283 | 3.75E-04 | 0.0306 | 0.08558 | 0.1946 | 20001 | 20000 |
| TP[1,1] | 0.7929 | 0.0268 | 1.96E-04 | 0.7374 | 0.7939 | 0.8427 | 20001 | 20000 |
| TP[1,2] | 0.09732 | 0.01401 | 9.62E-05 | 0.07211 | 0.09667 | 0.1265 | 20001 | 20000 |
| TP[1,3] | 0.07792 | 0.01461 | 1.06E-04 | 0.05193 | 0.07702 | 0.1094 | 20001 | 20000 |
| TP[1,4] | 0.03185 | 0.009735 | 7.35E-05 | 0.0159 | 0.03074 | 0.0537 | 20001 | 20000 |
| TP[2,1] | 0.6216 | 0.08683 | 7.94E-04 | 0.4356 | 0.6247 | 0.7853 | 20001 | 20000 |
| TP[2,2] | 0.1404 | 0.02431 | 1.92E-04 | 0.09274 | 0.1403 | 0.188 | 20001 | 20000 |
| TP[2,3] | 0.1458 | 0.03703 | 3.24E-04 | 0.0771 | 0.1441 | 0.2248 | 20001 | 20000 |
| TP[2,4] | 0.09214 | 0.04283 | 3.75E-04 | 0.0306 | 0.08558 | 0.1946 | 20001 | 20000 |
| d[2] | -0.5022 | 0.2183 | 2.05E-03 | -0.9454 | -0.5023 | -0.05605 | 20001 | 20000 |
| sd | 0.1903 | 0.1583 | 1.34E-03 | 0.006688 | 0.1493 | 0.5892 | 20001 | 20000 |
| totresdev | 15.19 | 3.262 | 2.64E-02 | 10.78 | 14.55 | 23.29 | 20001 | 20000 |
| z[2] | 0.4149 | 0.05651 | 3.93E-04 | 0.3103 | 0.4129 | 0.5313 | 20001 | 20000 |
| z[3] | 1.051 | 0.1006 | 7.42E-04 | 0.8631 | 1.049 | 1.258 | 20001 | 20000 |

**Table 38: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 61.647 | 56.251 | 5.396 | 67.042 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 63.033 | 57.638 | 5.396 | 68.429 |

### 4.2.2 Partial response

**Table 39: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.1166 | 0.2361 | 1.74E-03 | -57.98% | -0.1184 | 34.50% | 20001 | 20000 |
| T[1,1] | 0.5452 | 0.09117 | 6.75E-04 | 0.3651 | 0.5471 | 0.719 | 20001 | 20000 |
| T[1,2] | 0.7117 | 0.1271 | 1.30E-03 | 0.4274 | 0.725 | 0.9193 | 20001 | 20000 |
| T[2,1] | 0.2591 | 0.08482 | 6.27E-04 | 0.1146 | 0.2534 | 0.4415 | 20001 | 20000 |
| T[2,2] | 0.4322 | 0.1502 | 1.50E-03 | 0.163 | 0.4269 | 0.7383 | 20001 | 20000 |
| T[3,1] | 0.06268 | 0.03768 | 2.78E-04 | 0.01331 | 0.0547 | 0.1574 | 20001 | 20000 |
| T[3,2] | 0.1522 | 0.09856 | 9.62E-04 | 0.02425 | 0.1312 | 0.399 | 20001 | 20000 |
| TP[1,1] | 0.4548 | 0.09117 | 6.75E-04 | 0.281 | 0.4529 | 0.6349 | 20001 | 20000 |
| TP[1,2] | 0.286 | 0.04611 | 3.71E-04 | 0.2005 | 0.2848 | 0.3796 | 20001 | 20000 |
| TP[1,3] | 0.1965 | 0.05865 | 4.44E-04 | 0.0935 | 0.1927 | 0.3193 | 20001 | 20000 |
| TP[1,4] | 0.06268 | 0.03768 | 2.78E-04 | 0.01331 | 0.0547 | 0.1574 | 20001 | 20000 |
| TP[2,1] | 0.2883 | 0.1271 | 1.30E-03 | 0.08081 | 0.275 | 0.5727 | 20001 | 20000 |
| TP[2,2] | 0.2796 | 0.05726 | 4.81E-04 | 0.1631 | 0.2803 | 0.3896 | 20001 | 20000 |
| TP[2,3] | 0.2799 | 0.07738 | 7.10E-04 | 0.1263 | 0.2817 | 0.4285 | 20001 | 20000 |
| TP[2,4] | 0.1522 | 0.09856 | 9.62E-04 | 0.02425 | 0.1312 | 0.399 | 20001 | 20000 |
| d[2] | -0.4848 | 0.3184 | 3.74E-03 | -1.128 | -0.4835 | 0.1461 | 20001 | 20000 |
| sd | 0.2253 | 0.1722 | 1.54E-03 | 0.009707 | 0.1886 | 0.6406 | 20001 | 20000 |
| totresdev | 9.406 | 3.228 | 2.94E-02 | 4.998 | 8.782 | 17.38 | 20001 | 20000 |
| z[2] | 0.7858 | 0.133 | 1.06E-03 | 0.5426 | 0.7794 | 1.063 | 20001 | 20000 |
| z[3] | 1.72 | 0.2019 | 1.54E-03 | 1.342 | 1.713 | 2.133 | 20001 | 20000 |

**Table 40: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.766 | 37.471 | 5.295 | 48.061 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 44.152 | 38.858 | 5.295 | 49.447 |

### 4.2.3 Response

**Table 41: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.1845 | 0.3017 | 2.31E-03 | -77.61% | -0.188 | 40.50% | 20001 | 20000 |
| T[1,1] | 0.5701 | 0.1136 | 8.72E-04 | 0.3428 | 0.5746 | 0.7812 | 20001 | 20000 |
| T[1,2] | 0.7037 | 0.1465 | 1.80E-03 | 0.3773 | 0.7231 | 0.9318 | 20001 | 20000 |
| T[2,1] | 0.3764 | 0.1175 | 9.06E-04 | 0.1674 | 0.3712 | 0.6176 | 20001 | 20000 |
| T[2,2] | 0.5265 | 0.1702 | 2.08E-03 | 0.1963 | 0.53 | 0.8402 | 20001 | 20000 |
| T[3,1] | 0.1364 | 0.07427 | 5.86E-04 | 0.03226 | 0.1234 | 0.3171 | 20001 | 20000 |
| T[3,2] | 0.2479 | 0.1415 | 1.72E-03 | 0.04274 | 0.225 | 0.5787 | 20001 | 20000 |
| TP[1,1] | 0.4299 | 0.1136 | 8.72E-04 | 0.2188 | 0.4254 | 0.6573 | 20001 | 20000 |
| TP[1,2] | 0.1937 | 0.04417 | 3.13E-04 | 0.115 | 0.191 | 0.2869 | 20001 | 20000 |
| TP[1,3] | 0.24 | 0.06059 | 4.46E-04 | 0.1236 | 0.2399 | 0.3585 | 20001 | 20000 |
| TP[1,4] | 0.1364 | 0.07427 | 5.86E-04 | 0.03226 | 0.1234 | 0.3171 | 20001 | 20000 |
| TP[2,1] | 0.2963 | 0.1465 | 1.80E-03 | 0.06825 | 0.2769 | 0.623 | 20001 | 20000 |
| TP[2,2] | 0.1772 | 0.05139 | 4.53E-04 | 0.07899 | 0.1763 | 0.2809 | 20001 | 20000 |
| TP[2,3] | 0.2785 | 0.06507 | 5.74E-04 | 0.1403 | 0.2808 | 0.4001 | 20001 | 20000 |
| TP[2,4] | 0.2479 | 0.1415 | 1.72E-03 | 0.04274 | 0.225 | 0.5787 | 20001 | 20000 |
| d[2] | -0.4041 | 0.3462 | 5.49E-03 | -1.092 | -0.4009 | 0.2907 | 20001 | 20000 |
| sd | 0.2243 | 0.1743 | 1.61E-03 | 0.008202 | 0.1854 | 0.6503 | 20001 | 20000 |
| totresdev | 8.852 | 3.156 | 3.02E-02 | 4.582 | 8.238 | 16.53 | 20001 | 20000 |
| z[2] | 0.5156 | 0.1177 | 8.29E-04 | 0.3076 | 0.5075 | 0.768 | 20001 | 20000 |
| z[3] | 1.346 | 0.1714 | 1.32E-03 | 1.024 | 1.341 | 1.697 | 20001 | 20000 |

**Table 42: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 42.534 | 37.369 | 5.165 | 47.699 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 43.92 | 38.756 | 5.165 | 49.085 |

### 4.2.4 High Response

**Table 43: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6779 | 0.331 | 2.60E-03 | -132.80% | -0.6783 | -2.83% | 20001 | 20000 |
| T[1,1] | 0.7401 | 0.103 | 8.17E-04 | 0.5113 | 0.7512 | 0.908 | 20001 | 20000 |
| T[1,2] | 0.7866 | 0.1371 | 1.68E-03 | 0.4547 | 0.8129 | 0.9718 | 20001 | 20000 |
| T[2,1] | 0.6643 | 0.121 | 9.51E-04 | 0.4068 | 0.6738 | 0.8707 | 20001 | 20000 |
| T[2,2] | 0.7221 | 0.1582 | 1.94E-03 | 0.3618 | 0.7451 | 0.9543 | 20001 | 20000 |
| T[3,1] | 0.4545 | 0.1385 | 1.07E-03 | 0.193 | 0.4521 | 0.7287 | 20001 | 20000 |
| T[3,2] | 0.5327 | 0.1887 | 2.34E-03 | 0.1687 | 0.5362 | 0.8765 | 20001 | 20000 |
| TP[1,1] | 0.2599 | 0.103 | 8.17E-04 | 0.0921 | 0.2488 | 0.4887 | 20001 | 20000 |
| TP[1,2] | 0.07582 | 0.04065 | 2.89E-04 | 0.01802 | 0.06848 | 0.1746 | 20001 | 20000 |
| TP[1,3] | 0.2097 | 0.05637 | 4.01E-04 | 0.1085 | 0.2065 | 0.3286 | 20001 | 20000 |
| TP[1,4] | 0.4545 | 0.1385 | 1.07E-03 | 0.193 | 0.4521 | 0.7287 | 20001 | 20000 |
| TP[2,1] | 0.2134 | 0.1371 | 1.68E-03 | 0.02826 | 0.1871 | 0.5456 | 20001 | 20000 |
| TP[2,2] | 0.06455 | 0.03989 | 3.56E-04 | 0.01052 | 0.05681 | 0.1622 | 20001 | 20000 |
| TP[2,3] | 0.1894 | 0.06354 | 5.74E-04 | 0.06672 | 0.188 | 0.3193 | 20001 | 20000 |
| TP[2,4] | 0.5327 | 0.1887 | 2.34E-03 | 0.1687 | 0.5362 | 0.8765 | 20001 | 20000 |
| d[2] | -0.2157 | 0.3971 | 5.90E-03 | -0.99 | -0.2193 | 0.5586 | 20001 | 20000 |
| sd | 0.2334 | 0.1798 | 1.60E-03 | 0.00879 | 0.1933 | 0.6711 | 20001 | 20000 |
| totresdev | 13.12 | 3.21 | 2.89E-02 | 8.822 | 12.47 | 21.07 | 20001 | 20000 |
| z[2] | 0.2289 | 0.1091 | 7.62E-04 | 0.06513 | 0.2118 | 0.4852 | 20001 | 20000 |
| z[3] | 0.8001 | 0.1729 | 1.17E-03 | 0.4928 | 0.791 | 1.167 | 20001 | 20000 |

**Table 44: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 37.555 | 32.579 | 4.976 | 42.532 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 38.942 | 33.965 | 4.976 | 43.918 |

## 4.3 Week 4-8

### 4.3.1 Non response

**Table 45: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.9855 | 0.1059 | 7.90E-04 | 77.67% | 0.986 | 119.20% | 20001 | 20000 |
| T[1,1] | 0.1635 | 0.02607 | 1.94E-04 | 0.1166 | 0.1621 | 0.2187 | 20001 | 20000 |
| T[1,2] | 0.3401 | 0.09083 | 8.14E-04 | 0.1751 | 0.3353 | 0.5348 | 20001 | 20000 |
| T[2,1] | 0.0866 | 0.0193 | 1.44E-04 | 0.05342 | 0.08506 | 0.1281 | 20001 | 20000 |
| T[2,2] | 0.216 | 0.07571 | 6.64E-04 | 0.09204 | 0.2084 | 0.3869 | 20001 | 20000 |
| T[3,1] | 0.03851 | 0.01193 | 9.36E-05 | 0.01901 | 0.03715 | 0.06528 | 20001 | 20000 |
| T[3,2] | 0.1183 | 0.05458 | 4.79E-04 | 0.03883 | 0.1101 | 0.2469 | 20001 | 20000 |
| TP[1,1] | 0.8365 | 0.02607 | 1.94E-04 | 0.7813 | 0.8379 | 0.8834 | 20001 | 20000 |
| TP[1,2] | 0.07694 | 0.01361 | 9.80E-05 | 0.05264 | 0.07607 | 0.1057 | 20001 | 20000 |
| TP[1,3] | 0.04809 | 0.0115 | 8.58E-05 | 0.02845 | 0.04703 | 0.07366 | 20001 | 20000 |
| TP[1,4] | 0.03851 | 0.01193 | 9.36E-05 | 0.01901 | 0.03715 | 0.06528 | 20001 | 20000 |
| TP[2,1] | 0.6599 | 0.09083 | 8.14E-04 | 0.4654 | 0.6647 | 0.825 | 20001 | 20000 |
| TP[2,2] | 0.1241 | 0.02583 | 2.17E-04 | 0.0743 | 0.1238 | 0.1761 | 20001 | 20000 |
| TP[2,3] | 0.09771 | 0.02899 | 2.45E-04 | 0.04665 | 0.09562 | 0.1606 | 20001 | 20000 |
| TP[2,4] | 0.1183 | 0.05458 | 4.79E-04 | 0.03883 | 0.1101 | 0.2469 | 20001 | 20000 |
| d[2] | -0.5605 | 0.2338 | 2.07E-03 | -1.033 | -0.5611 | -0.09542 | 20001 | 20000 |
| sd | 0.1976 | 0.1632 | 1.32E-03 | 0.007049 | 0.1565 | 0.6043 | 20001 | 20000 |
| totresdev | 8.381 | 3.244 | 2.82E-02 | 4.025 | 7.762 | 16.43 | 20001 | 20000 |
| z[2] | 0.3867 | 0.06241 | 4.48E-04 | 0.2715 | 0.3842 | 0.517 | 20001 | 20000 |
| z[3] | 0.8008 | 0.09724 | 7.50E-04 | 0.6206 | 0.7976 | 0.9999 | 20001 | 20000 |

**Table 46: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 51.628 | 46.287 | 5.341 | 56.968 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 53.014 | 47.673 | 5.341 | 58.355 |

### 4.3.2 Partial response

**Table 47: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.4316 | 0.2592 | 2.00E-03 | -93.64% | -0.4302 | 7.34% | 20001 | 20000 |
| T[1,1] | 0.6619 | 0.09194 | 7.08E-04 | 0.4708 | 0.6665 | 0.8255 | 20001 | 20000 |
| T[1,2] | 0.7099 | 0.1384 | 1.51E-03 | 0.3969 | 0.728 | 0.9314 | 20001 | 20000 |
| T[2,1] | 0.3382 | 0.1034 | 7.98E-04 | 0.1555 | 0.3322 | 0.5543 | 20001 | 20000 |
| T[2,2] | 0.4052 | 0.1602 | 1.79E-03 | 0.12 | 0.3971 | 0.7382 | 20001 | 20000 |
| T[3,1] | 0.1204 | 0.0628 | 5.20E-04 | 0.0316 | 0.109 | 0.2726 | 20001 | 20000 |
| T[3,2] | 0.1686 | 0.1115 | 1.23E-03 | 0.02292 | 0.1453 | 0.4521 | 20001 | 20000 |
| TP[1,1] | 0.3381 | 0.09194 | 7.08E-04 | 0.1745 | 0.3335 | 0.5292 | 20001 | 20000 |
| TP[1,2] | 0.3238 | 0.04969 | 3.82E-04 | 0.2278 | 0.3229 | 0.4236 | 20001 | 20000 |
| TP[1,3] | 0.2178 | 0.05727 | 3.97E-04 | 0.1113 | 0.2162 | 0.3338 | 20001 | 20000 |
| TP[1,4] | 0.1204 | 0.0628 | 5.20E-04 | 0.0316 | 0.109 | 0.2726 | 20001 | 20000 |
| TP[2,1] | 0.2901 | 0.1384 | 1.51E-03 | 0.06864 | 0.272 | 0.6031 | 20001 | 20000 |
| TP[2,2] | 0.3048 | 0.06099 | 5.47E-04 | 0.1741 | 0.3068 | 0.4177 | 20001 | 20000 |
| TP[2,3] | 0.2365 | 0.07132 | 6.82E-04 | 0.09166 | 0.2387 | 0.3717 | 20001 | 20000 |
| TP[2,4] | 0.1686 | 0.1115 | 1.23E-03 | 0.02292 | 0.1453 | 0.4521 | 20001 | 20000 |
| d[2] | -0.1716 | 0.3557 | 4.33E-03 | -0.8758 | -0.1754 | 0.5442 | 20001 | 20000 |
| sd | 0.307 | 0.1993 | 2.07E-03 | 0.01449 | 0.2819 | 0.7544 | 20001 | 20000 |
| totresdev | 18.04 | 3.555 | 3.43E-02 | 12.66 | 17.54 | 26.45 | 20001 | 20000 |
| z[2] | 0.8668 | 0.1363 | 1.01E-03 | 0.6179 | 0.8608 | 1.151 | 20001 | 20000 |
| z[3] | 1.663 | 0.1858 | 1.43E-03 | 1.311 | 1.659 | 2.037 | 20001 | 20000 |

**Table 48: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 51.409 | 45.822 | 5.587 | 56.997 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 52.796 | 47.208 | 5.587 | 58.383 |

### 4.3.3 Response

**Table 49: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.6181 | 0.2424 | 1.82E-03 | -109.70% | -0.6174 | -14.51% | 20001 | 20000 |
| T[1,1] | 0.726 | 0.07876 | 5.91E-04 | 0.5578 | 0.7315 | 0.8637 | 20001 | 20000 |
| T[1,2] | 0.7355 | 0.1194 | 1.21E-03 | 0.4667 | 0.7479 | 0.9283 | 20001 | 20000 |
| T[2,1] | 0.6471 | 0.09165 | 6.68E-04 | 0.4568 | 0.6523 | 0.8128 | 20001 | 20000 |
| T[2,2] | 0.6612 | 0.1343 | 1.36E-03 | 0.3713 | 0.6708 | 0.8936 | 20001 | 20000 |
| T[3,1] | 0.3019 | 0.09547 | 7.13E-04 | 0.1369 | 0.2956 | 0.5049 | 20001 | 20000 |
| T[3,2] | 0.3278 | 0.1393 | 1.42E-03 | 0.09831 | 0.3122 | 0.6363 | 20001 | 20000 |
| TP[1,1] | 0.274 | 0.07876 | 5.91E-04 | 0.1363 | 0.2685 | 0.4423 | 20001 | 20000 |
| TP[1,2] | 0.07884 | 0.02982 | 2.11E-04 | 0.03181 | 0.07508 | 0.1461 | 20001 | 20000 |
| TP[1,3] | 0.3453 | 0.04702 | 3.61E-04 | 0.2555 | 0.3445 | 0.4402 | 20001 | 20000 |
| TP[1,4] | 0.3019 | 0.09547 | 7.13E-04 | 0.1369 | 0.2956 | 0.5049 | 20001 | 20000 |
| TP[2,1] | 0.2645 | 0.1194 | 1.21E-03 | 0.07178 | 0.2521 | 0.5335 | 20001 | 20000 |
| TP[2,2] | 0.07438 | 0.03073 | 2.48E-04 | 0.0248 | 0.07094 | 0.1432 | 20001 | 20000 |
| TP[2,3] | 0.3334 | 0.05476 | 4.20E-04 | 0.219 | 0.3348 | 0.4363 | 20001 | 20000 |
| TP[2,4] | 0.3278 | 0.1393 | 1.42E-03 | 0.09831 | 0.3122 | 0.6363 | 20001 | 20000 |
| d[2] | -0.05745 | 0.3069 | 3.59E-03 | -0.6725 | -0.05235 | 0.5431 | 20001 | 20000 |
| sd | 0.226 | 0.1752 | 1.57E-03 | 0.00864 | 0.1884 | 0.6524 | 20001 | 20000 |
| totresdev | 14.96 | 3.258 | 2.71E-02 | 10.58 | 14.33 | 22.94 | 20001 | 20000 |
| z[2] | 0.2285 | 0.07793 | 5.61E-04 | 0.1003 | 0.22 | 0.4042 | 20001 | 20000 |
| z[3] | 1.158 | 0.1447 | 1.08E-03 | 0.8889 | 1.153 | 1.455 | 20001 | 20000 |

**Table 50: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 48.835 | 43.603 | 5.232 | 54.066 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 50.221 | 44.99 | 5.232 | 55.453 |

### 4.3.4 High Response

**Table 51: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.4664 | 0.2673 | 2.14E-03 | -99.11% | -0.4646 | 4.76% | 20001 | 20000 |
| T[1,1] | 0.6738 | 0.09336 | 7.45E-04 | 0.4811 | 0.6789 | 0.8392 | 20001 | 20000 |
| T[1,2] | 0.846 | 0.107 | 1.17E-03 | 0.576 | 0.871 | 0.9798 | 20001 | 20000 |
| T[2,1] | 0.6001 | 0.1047 | 8.00E-04 | 0.3877 | 0.6038 | 0.791 | 20001 | 20000 |
| T[2,2] | 0.7979 | 0.1261 | 1.39E-03 | 0.4885 | 0.8241 | 0.9681 | 20001 | 20000 |
| T[3,1] | 0.482 | 0.1126 | 8.48E-04 | 0.2653 | 0.4821 | 0.7015 | 20001 | 20000 |
| T[3,2] | 0.7097 | 0.1516 | 1.72E-03 | 0.3627 | 0.7326 | 0.94 | 20001 | 20000 |
| TP[1,1] | 0.3262 | 0.09336 | 7.45E-04 | 0.1608 | 0.3211 | 0.519 | 20001 | 20000 |
| TP[1,2] | 0.07379 | 0.03357 | 2.29E-04 | 0.0231 | 0.06879 | 0.1526 | 20001 | 20000 |
| TP[1,3] | 0.118 | 0.03811 | 2.73E-04 | 0.05442 | 0.1143 | 0.202 | 20001 | 20000 |
| TP[1,4] | 0.482 | 0.1126 | 8.48E-04 | 0.2653 | 0.4821 | 0.7015 | 20001 | 20000 |
| TP[2,1] | 0.154 | 0.107 | 1.17E-03 | 0.02029 | 0.129 | 0.424 | 20001 | 20000 |
| TP[2,2] | 0.04817 | 0.03015 | 2.77E-04 | 0.007949 | 0.04219 | 0.123 | 20001 | 20000 |
| TP[2,3] | 0.08813 | 0.0405 | 3.96E-04 | 0.02287 | 0.08378 | 0.1777 | 20001 | 20000 |
| TP[2,4] | 0.7097 | 0.1516 | 1.72E-03 | 0.3627 | 0.7326 | 0.94 | 20001 | 20000 |
| d[2] | -0.6594 | 0.3888 | 4.95E-03 | -1.422 | -0.6653 | 0.1303 | 20001 | 20000 |
| sd | 0.3093 | 0.2048 | 2.16E-03 | 0.01482 | 0.2836 | 0.7724 | 20001 | 20000 |
| totresdev | 11.44 | 3.552 | 3.08E-02 | 5.98 | 10.97 | 19.79 | 20001 | 20000 |
| z[2] | 0.2032 | 0.08755 | 6.07E-04 | 0.06749 | 0.191 | 0.4068 | 20001 | 20000 |
| z[3] | 0.5135 | 0.1268 | 8.88E-04 | 0.2882 | 0.5048 | 0.7841 | 20001 | 20000 |

**Table 52: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 38.826 | 33.467 | 5.359 | 44.185 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 40.212 | 34.853 | 5.359 | 45.572 |

## 4.4 Week 8-12

### 4.4.1 Non response

**Table 53: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.843 | 0.1017 | 7.63E-04 | 64.38% | 0.8426 | 104.50% | 20001 | 20000 |
| T[1,1] | 0.2008 | 0.02841 | 2.14E-04 | 0.1481 | 0.1997 | 0.2599 | 20001 | 20000 |
| T[1,2] | 0.2248 | 0.07954 | 7.15E-04 | 0.09202 | 0.2166 | 0.4068 | 20001 | 20000 |
| T[2,1] | 0.1285 | 0.02428 | 1.73E-04 | 0.08475 | 0.1273 | 0.1797 | 20001 | 20000 |
| T[2,2] | 0.1487 | 0.06427 | 5.70E-04 | 0.0514 | 0.1398 | 0.3001 | 20001 | 20000 |
| T[3,1] | 0.05463 | 0.01577 | 1.14E-04 | 0.02857 | 0.05317 | 0.08979 | 20001 | 20000 |
| T[3,2] | 0.06725 | 0.03955 | 3.41E-04 | 0.01638 | 0.05961 | 0.1639 | 20001 | 20000 |
| TP[1,1] | 0.7992 | 0.02841 | 2.14E-04 | 0.7402 | 0.8003 | 0.852 | 20001 | 20000 |
| TP[1,2] | 0.07229 | 0.01384 | 9.73E-05 | 0.04744 | 0.07161 | 0.1014 | 20001 | 20000 |
| TP[1,3] | 0.0739 | 0.01526 | 1.02E-04 | 0.0469 | 0.07282 | 0.1067 | 20001 | 20000 |
| TP[1,4] | 0.05463 | 0.01577 | 1.14E-04 | 0.02857 | 0.05317 | 0.08979 | 20001 | 20000 |
| TP[2,1] | 0.7752 | 0.07954 | 7.15E-04 | 0.5934 | 0.7835 | 0.9081 | 20001 | 20000 |
| TP[2,2] | 0.07611 | 0.02174 | 1.77E-04 | 0.03657 | 0.07479 | 0.1232 | 20001 | 20000 |
| TP[2,3] | 0.08147 | 0.0296 | 2.54E-04 | 0.03211 | 0.07861 | 0.1495 | 20001 | 20000 |
| TP[2,4] | 0.06725 | 0.03955 | 3.41E-04 | 0.01638 | 0.05961 | 0.1639 | 20001 | 20000 |
| d[2] | -0.06024 | 0.2528 | 2.28E-03 | -0.5717 | -0.05983 | 0.4548 | 20001 | 20000 |
| sd | 0.2232 | 0.1712 | 1.53E-03 | 0.008657 | 0.1857 | 0.6428 | 20001 | 20000 |
| totresdev | 12.39 | 3.313 | 2.69E-02 | 7.826 | 11.76 | 20.46 | 20001 | 20000 |
| z[2] | 0.298 | 0.05688 | 3.71E-04 | 0.196 | 0.2951 | 0.4189 | 20001 | 20000 |
| z[3] | 0.7749 | 0.1009 | 6.63E-04 | 0.589 | 0.7702 | 0.9814 | 20001 | 20000 |

**Table 54: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 53.453 | 48.005 | 5.448 | 58.902 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 54.84 | 49.391 | 5.448 | 60.288 |

### 4.4.2 Partial response

**Table 55: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.08234 | 0.2504 | 1.92E-03 | -57.31% | -0.08283 | 40.90% | 20001 | 20000 |
| T[1,1] | 0.5318 | 0.09662 | 7.38E-04 | 0.3413 | 0.533 | 0.7167 | 20001 | 20000 |
| T[1,2] | 0.6458 | 0.1456 | 1.60E-03 | 0.3375 | 0.656 | 0.8962 | 20001 | 20000 |
| T[2,1] | 0.2628 | 0.09083 | 7.13E-04 | 0.1106 | 0.2552 | 0.4612 | 20001 | 20000 |
| T[2,2] | 0.379 | 0.1547 | 1.70E-03 | 0.1148 | 0.3679 | 0.7054 | 20001 | 20000 |
| T[3,1] | 0.06996 | 0.04353 | 3.19E-04 | 0.01387 | 0.06058 | 0.1796 | 20001 | 20000 |
| T[3,2] | 0.1329 | 0.09712 | 1.00E-03 | 0.01623 | 0.1098 | 0.3821 | 20001 | 20000 |
| TP[1,1] | 0.4682 | 0.09662 | 7.38E-04 | 0.2833 | 0.467 | 0.6587 | 20001 | 20000 |
| TP[1,2] | 0.2691 | 0.04978 | 3.35E-04 | 0.1765 | 0.2677 | 0.3716 | 20001 | 20000 |
| TP[1,3] | 0.1928 | 0.06008 | 4.76E-04 | 0.08756 | 0.1888 | 0.3207 | 20001 | 20000 |
| TP[1,4] | 0.06996 | 0.04353 | 3.19E-04 | 0.01387 | 0.06058 | 0.1796 | 20001 | 20000 |
| TP[2,1] | 0.3542 | 0.1456 | 1.60E-03 | 0.1039 | 0.3441 | 0.6626 | 20001 | 20000 |
| TP[2,2] | 0.2668 | 0.05773 | 4.10E-04 | 0.1544 | 0.2666 | 0.3815 | 20001 | 20000 |
| TP[2,3] | 0.246 | 0.07995 | 8.20E-04 | 0.09233 | 0.2462 | 0.4005 | 20001 | 20000 |
| TP[2,4] | 0.1329 | 0.09712 | 1.00E-03 | 0.01623 | 0.1098 | 0.3821 | 20001 | 20000 |
| d[2] | -0.3241 | 0.3434 | 4.10E-03 | -1.012 | -0.3225 | 0.3451 | 20001 | 20000 |
| sd | 0.2532 | 0.1846 | 1.68E-03 | 0.01187 | 0.2195 | 0.6911 | 20001 | 20000 |
| totresdev | 14.83 | 3.285 | 2.70E-02 | 10.18 | 14.23 | 22.82 | 20001 | 20000 |
| z[2] | 0.7431 | 0.1439 | 1.03E-03 | 0.4833 | 0.7345 | 1.045 | 20001 | 20000 |
| z[3] | 1.635 | 0.211 | 1.46E-03 | 1.241 | 1.628 | 2.066 | 20001 | 20000 |

**Table 56: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 47.504 | 42.185 | 5.319 | 52.823 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 48.89 | 43.572 | 5.319 | 54.209 |

### 4.4.3 Response

**Table 57: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.7273 | 0.2764 | 2.04E-03 | -126.50% | -0.7279 | -17.59% | 20001 | 20000 |
| T[1,1] | 0.7583 | 0.08404 | 6.19E-04 | 0.5699 | 0.7667 | 0.8972 | 20001 | 20000 |
| T[1,2] | 0.8004 | 0.114 | 1.15E-03 | 0.5252 | 0.8205 | 0.961 | 20001 | 20000 |
| T[2,1] | 0.6749 | 0.1013 | 7.28E-04 | 0.4569 | 0.6828 | 0.8501 | 20001 | 20000 |
| T[2,2] | 0.728 | 0.136 | 1.36E-03 | 0.414 | 0.7466 | 0.9377 | 20001 | 20000 |
| T[3,1] | 0.3082 | 0.1081 | 8.02E-04 | 0.1198 | 0.3011 | 0.5376 | 20001 | 20000 |
| T[3,2] | 0.3801 | 0.1595 | 1.58E-03 | 0.1041 | 0.3701 | 0.7148 | 20001 | 20000 |
| TP[1,1] | 0.2417 | 0.08404 | 6.19E-04 | 0.1029 | 0.2333 | 0.4302 | 20001 | 20000 |
| TP[1,2] | 0.0834 | 0.03467 | 2.46E-04 | 0.02977 | 0.07866 | 0.1631 | 20001 | 20000 |
| TP[1,3] | 0.3667 | 0.05293 | 3.64E-04 | 0.2635 | 0.3662 | 0.4711 | 20001 | 20000 |
| TP[1,4] | 0.3082 | 0.1081 | 8.02E-04 | 0.1198 | 0.3011 | 0.5376 | 20001 | 20000 |
| TP[2,1] | 0.1996 | 0.114 | 1.15E-03 | 0.03899 | 0.1795 | 0.475 | 20001 | 20000 |
| TP[2,2] | 0.07242 | 0.03571 | 2.94E-04 | 0.01805 | 0.06733 | 0.1539 | 20001 | 20000 |
| TP[2,3] | 0.3479 | 0.06594 | 4.74E-04 | 0.2053 | 0.3517 | 0.4693 | 20001 | 20000 |
| TP[2,4] | 0.3801 | 0.1595 | 1.58E-03 | 0.1041 | 0.3701 | 0.7148 | 20001 | 20000 |
| d[2] | -0.1903 | 0.3304 | 3.81E-03 | -0.8485 | -0.1907 | 0.467 | 20001 | 20000 |
| sd | 0.2583 | 0.1876 | 1.89E-03 | 0.009986 | 0.2252 | 0.6999 | 20001 | 20000 |
| totresdev | 7.51 | 3.347 | 2.74E-02 | 2.765 | 6.893 | 15.5 | 20001 | 20000 |
| z[2] | 0.2549 | 0.09166 | 6.57E-04 | 0.1057 | 0.2435 | 0.4596 | 20001 | 20000 |
| z[3] | 1.254 | 0.1649 | 1.18E-03 | 0.9492 | 1.248 | 1.592 | 20001 | 20000 |

**Table 58: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 41.33 | 36.022 | 5.307 | 46.637 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 42.716 | 37.409 | 5.307 | 48.023 |

### 4.4.4 High Response

**Table 59: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | -0.7136 | 0.2305 | 1.67E-03 | -116.90% | -0.7124 | -26.46% | 20001 | 20000 |
| T[1,1] | 0.7566 | 0.07077 | 5.12E-04 | 0.6044 | 0.7619 | 0.8788 | 20001 | 20000 |
| T[1,2] | 0.8721 | 0.07545 | 8.37E-04 | 0.6856 | 0.8873 | 0.9732 | 20001 | 20000 |
| T[2,1] | 0.6802 | 0.08468 | 5.94E-04 | 0.5025 | 0.6853 | 0.8303 | 20001 | 20000 |
| T[2,2] | 0.8203 | 0.09437 | 1.05E-03 | 0.5969 | 0.8364 | 0.9565 | 20001 | 20000 |
| T[3,1] | 0.4347 | 0.09984 | 7.06E-04 | 0.2465 | 0.4323 | 0.636 | 20001 | 20000 |
| T[3,2] | 0.6198 | 0.136 | 1.55E-03 | 0.3348 | 0.6284 | 0.8598 | 20001 | 20000 |
| TP[1,1] | 0.2434 | 0.07077 | 5.12E-04 | 0.1213 | 0.2381 | 0.3956 | 20001 | 20000 |
| TP[1,2] | 0.07643 | 0.02921 | 1.90E-04 | 0.02976 | 0.07288 | 0.1434 | 20001 | 20000 |
| TP[1,3] | 0.2455 | 0.0425 | 2.98E-04 | 0.1658 | 0.2444 | 0.3313 | 20001 | 20000 |
| TP[1,4] | 0.4347 | 0.09984 | 7.06E-04 | 0.2465 | 0.4323 | 0.636 | 20001 | 20000 |
| TP[2,1] | 0.1279 | 0.07545 | 8.37E-04 | 0.0268 | 0.1127 | 0.3146 | 20001 | 20000 |
| TP[2,2] | 0.05174 | 0.02688 | 2.50E-04 | 0.01287 | 0.04703 | 0.1158 | 20001 | 20000 |
| TP[2,3] | 0.2005 | 0.0559 | 5.73E-04 | 0.08998 | 0.2017 | 0.3086 | 20001 | 20000 |
| TP[2,4] | 0.6198 | 0.136 | 1.55E-03 | 0.3348 | 0.6284 | 0.8598 | 20001 | 20000 |
| d[2] | -0.4964 | 0.2895 | 3.69E-03 | -1.066 | -0.4962 | 0.07437 | 20001 | 20000 |
| sd | 0.2101 | 0.1683 | 1.44E-03 | 0.007919 | 0.1693 | 0.6284 | 20001 | 20000 |
| totresdev | 10.58 | 3.209 | 2.67E-02 | 6.289 | 9.925 | 18.55 | 20001 | 20000 |
| z[2] | 0.2319 | 0.07819 | 5.09E-04 | 0.1025 | 0.2246 | 0.404 | 20001 | 20000 |
| z[3] | 0.8837 | 0.1273 | 8.41E-04 | 0.6479 | 0.8788 | 1.147 | 20001 | 20000 |

**Table 60: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 44.944 | 39.786 | 5.158 | 50.102 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 46.33 | 41.172 | 5.158 | 51.488 |

## 4.5 Week 12-36

### 4.5.1 Non response

**Table 61: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 1.616 | 0.2328 | 0.00164 | 1.161 | 1.617 | 2.075 | 20001 | 20000 |
| T[1,1] | 0.05771 | 0.02701 | 1.90E-04 | 0.01901 | 0.05295 | 0.1227 | 20001 | 20000 |
| T[1,2] | 0.2504 | 0.1453 | 0.001629 | 0.04051 | 0.2261 | 0.5929 | 20001 | 20000 |
| T[1,3] | 0.2968 | 0.1564 | 0.001879 | 0.0572 | 0.2757 | 0.6538 | 20001 | 20000 |
| T[2,1] | 0.04102 | 0.02148 | 1.53E-04 | 0.01164 | 0.03686 | 0.09323 | 20001 | 20000 |
| T[2,2] | 0.2042 | 0.1319 | 0.001466 | 0.02643 | 0.178 | 0.5283 | 20001 | 20000 |
| T[2,3] | 0.2458 | 0.1445 | 0.001727 | 0.0394 | 0.2209 | 0.59 | 20001 | 20000 |
| T[3,1] | 0.01712 | 0.01152 | 8.36E-05 | 0.003288 | 0.01439 | 0.04647 | 20001 | 20000 |
| T[3,2] | 0.1191 | 0.09851 | 1.05E-03 | 0.009438 | 0.09319 | 0.3816 | 20001 | 20000 |
| T[3,3] | 0.1488 | 0.1127 | 1.30E-03 | 1.44E-02 | 0.121 | 0.438 | 20001 | 20000 |
| TP[1,1] | 0.9423 | 0.02701 | 1.90E-04 | 0.8773 | 0.9471 | 0.981 | 20001 | 20000 |
| TP[1,2] | 0.01669 | 0.008796 | 5.79E-05 | 0.00472 | 0.01507 | 0.03844 | 20001 | 20000 |
| TP[1,3] | 0.0239 | 0.0122 | 8.68E-05 | 0.007082 | 0.02159 | 0.05393 | 20001 | 20000 |
| TP[1,4] | 0.01712 | 0.01152 | 8.36E-05 | 0.003288 | 0.01439 | 0.04647 | 20001 | 20000 |
| TP[2,1] | 0.7496 | 0.1453 | 0.001629 | 0.4076 | 0.7739 | 0.9595 | 20001 | 20000 |
| TP[2,2] | 0.04621 | 0.02441 | 2.19E-04 | 0.009873 | 0.04258 | 0.1032 | 20001 | 20000 |
| TP[2,3] | 0.08506 | 0.04454 | 4.75E-04 | 0.01526 | 0.07936 | 0.185 | 20001 | 20000 |
| TP[2,4] | 0.1191 | 0.09851 | 1.05E-03 | 0.009438 | 0.09319 | 0.3816 | 20001 | 20000 |
| TP[3,1] | 0.7032 | 0.1564 | 0.001879 | 0.3463 | 0.7243 | 0.9429 | 20001 | 20000 |
| TP[3,2] | 0.05093 | 0.02514 | 2.21E-04 | 0.01245 | 0.04737 | 0.1098 | 20001 | 20000 |
| TP[3,3] | 0.09699 | 0.04586 | 4.99E-04 | 0.02149 | 0.09263 | 0.1965 | 20001 | 20000 |
| TP[3,4] | 0.1488 | 0.1127 | 1.30E-03 | 1.44E-02 | 0.121 | 0.438 | 20001 | 20000 |
| d[2] | -0.8639 | 0.4474 | 0.005513 | -1.747 | -0.8657 | 0.005823 | 20001 | 20000 |
| d[3] | -1.021 | 0.4434 | 0.005896 | -1.893 | -1.019 | -0.1492 | 20001 | 20000 |
| sd | 0.2273 | 0.1766 | 0.001815 | 0.008233 | 0.1899 | 0.656 | 20001 | 20000 |
| totresdev | 12.56 | 3.488 | 3.16E-02 | 7.676 | 11.94 | 21.1 | 20001 | 20000 |
| z[2] | 0.1727 | 0.06813 | 4.59E-04 | 0.06634 | 0.1638 | 0.3306 | 20001 | 20000 |
| z[3] | 0.5738 | 0.1277 | 8.35E-04 | 0.347 | 0.5656 | 0.8472 | 20001 | 20000 |

**Table 62: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 45.97 | 39.982 | 5.988 | 51.958 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 47.356 | 41.368 | 5.988 | 53.344 |

### 4.5.2 Partial response

**Table 63: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.2953 | 0.4131 | 0.004142 | -0.5218 | 0.298 | 1.103 | 10001 | 10000 |
| T[1,1] | 0.3924 | 0.1475 | 1.50E-03 | 0.1352 | 0.3829 | 0.6993 | 10001 | 10000 |
| T[1,2] | 0.7037 | 0.2046 | 0.003979 | 0.2426 | 0.7403 | 0.9815 | 10001 | 10000 |
| T[1,3] | 0.2012 | 0.1855 | 0.004358 | 0.004802 | 0.1452 | 0.692 | 10001 | 10000 |
| T[2,1] | 0.2813 | 0.1379 | 1.43E-03 | 0.06687 | 0.2617 | 0.5873 | 10001 | 10000 |
| T[2,2] | 0.6022 | 0.2271 | 0.004407 | 0.1447 | 0.6215 | 0.9609 | 10001 | 10000 |
| T[2,3] | 0.1371 | 0.1539 | 0.003508 | 0.001503 | 0.08133 | 0.5795 | 10001 | 10000 |
| T[3,1] | 0.1491 | 0.1038 | 1.09E-03 | 0.01807 | 0.1247 | 0.4059 | 10001 | 10000 |
| T[3,2] | 0.4353 | 0.2347 | 4.42E-03 | 0.05379 | 0.4142 | 0.8977 | 10001 | 10000 |
| T[3,3] | 0.06959 | 0.1052 | 2.21E-03 | 2.00E-04 | 0.02763 | 0.3908 | 10001 | 10000 |
| TP[1,1] | 0.6076 | 0.1475 | 1.50E-03 | 0.3009 | 0.6172 | 0.865 | 10001 | 10000 |
| TP[1,2] | 0.1111 | 0.05318 | 6.07E-04 | 0.0303 | 0.103 | 0.236 | 10001 | 10000 |
| TP[1,3] | 0.1322 | 0.06225 | 6.36E-04 | 0.03564 | 0.1237 | 0.2731 | 10001 | 10000 |
| TP[1,4] | 0.1491 | 0.1038 | 1.09E-03 | 0.01807 | 0.1247 | 0.4059 | 10001 | 10000 |
| TP[2,1] | 0.2963 | 0.2046 | 0.003979 | 0.01873 | 0.2598 | 0.758 | 10001 | 10000 |
| TP[2,2] | 0.1016 | 0.05959 | 7.91E-04 | 0.01443 | 0.09247 | 0.2422 | 10001 | 10000 |
| TP[2,3] | 0.1669 | 0.07581 | 7.98E-04 | 0.03821 | 0.1604 | 0.3321 | 10001 | 10000 |
| TP[2,4] | 0.4353 | 0.2347 | 4.42E-03 | 0.05379 | 0.4142 | 0.8977 | 10001 | 10000 |
| TP[3,1] | 0.7988 | 0.1855 | 0.004358 | 0.3081 | 0.8548 | 0.9952 | 10001 | 10000 |
| TP[3,2] | 0.06409 | 0.05099 | 1.00E-03 | 0.002399 | 0.0518 | 0.1898 | 10001 | 10000 |
| TP[3,3] | 0.06753 | 0.06303 | 1.39E-03 | 0.001138 | 0.04857 | 0.2289 | 10001 | 10000 |
| TP[3,4] | 0.06959 | 0.1052 | 2.21E-03 | 2.00E-04 | 0.02763 | 0.3908 | 10001 | 10000 |
| d[2] | -0.9545 | 0.585 | 0.01375 | -2.122 | -0.9413 | 0.1959 | 10001 | 10000 |
| d[3] | 0.7641 | 0.6612 | 0.01924 | -0.5227 | 0.759 | 2.097 | 10001 | 10000 |
| sd | 0.2402 | 0.18 | 0.002399 | 0.009873 | 0.2043 | 0.6677 | 10001 | 10000 |
| totresdev | 13.41 | 3.439 | 5.24E-02 | 8.677 | 12.77 | 21.99 | 10001 | 10000 |
| z[2] | 0.3375 | 0.1575 | 1.82E-03 | 0.09716 | 0.3153 | 0.7074 | 10001 | 10000 |
| z[3] | 0.857 | 0.2374 | 2.84E-03 | 0.4398 | 0.8468 | 1.366 | 10001 | 10000 |

**Table 64: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 33.216 | 27.451 | 5.765 | 38.981 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 34.603 | 28.838 | 5.765 | 40.367 |

### 4.5.3 Response

**Table 65: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.5684 | 0.3161 | 0.002101 | -0.04774 | 0.5716 | 1.181 | 20001 | 20000 |
| T[1,1] | 0.2939 | 0.1046 | 6.93E-04 | 0.1188 | 0.2838 | 0.5194 | 20001 | 20000 |
| T[1,2] | 0.4849 | 0.1977 | 0.002797 | 0.1222 | 0.4812 | 0.8633 | 20001 | 20000 |
| T[1,3] | 0.4956 | 0.2054 | 0.002909 | 0.1179 | 0.4949 | 0.8833 | 20001 | 20000 |
| T[2,1] | 0.2678 | 0.1016 | 6.71E-04 | 0.1009 | 0.2575 | 0.4893 | 20001 | 20000 |
| T[2,2] | 0.4564 | 0.1974 | 0.002795 | 0.1059 | 0.4485 | 0.8444 | 20001 | 20000 |
| T[2,3] | 0.4675 | 0.2054 | 0.002914 | 0.1019 | 0.4627 | 0.8659 | 20001 | 20000 |
| T[3,1] | 0.1383 | 0.07505 | 5.05E-04 | 0.03236 | 0.125 | 0.3192 | 20001 | 20000 |
| T[3,2] | 0.2937 | 0.1777 | 2.46E-03 | 0.03712 | 0.2653 | 0.7031 | 20001 | 20000 |
| T[3,3] | 0.305 | 0.1868 | 2.63E-03 | 3.59E-02 | 0.275 | 0.7343 | 20001 | 20000 |
| TP[1,1] | 0.7061 | 0.1046 | 6.93E-04 | 0.481 | 0.7162 | 0.8812 | 20001 | 20000 |
| TP[1,2] | 0.02616 | 0.01854 | 1.28E-04 | 0.003172 | 0.02202 | 0.07292 | 20001 | 20000 |
| TP[1,3] | 0.1294 | 0.04519 | 3.14E-04 | 0.05399 | 0.1254 | 0.2292 | 20001 | 20000 |
| TP[1,4] | 0.1383 | 0.07505 | 5.05E-04 | 0.03236 | 0.125 | 0.3192 | 20001 | 20000 |
| TP[2,1] | 0.5151 | 0.1977 | 0.002797 | 0.1368 | 0.5189 | 0.8779 | 20001 | 20000 |
| TP[2,2] | 0.02844 | 0.02071 | 1.50E-04 | 0.003186 | 0.02372 | 0.08078 | 20001 | 20000 |
| TP[2,3] | 0.1627 | 0.05796 | 5.68E-04 | 0.0552 | 0.1607 | 0.2832 | 20001 | 20000 |
| TP[2,4] | 0.2937 | 0.1777 | 2.46E-03 | 0.03712 | 0.2653 | 0.7031 | 20001 | 20000 |
| TP[3,1] | 0.5044 | 0.2054 | 0.002909 | 0.1168 | 0.5051 | 0.8822 | 20001 | 20000 |
| TP[3,2] | 0.0281 | 0.0205 | 1.52E-04 | 0.003124 | 0.02336 | 0.08018 | 20001 | 20000 |
| TP[3,3] | 0.1624 | 0.05872 | 5.72E-04 | 0.05292 | 0.1604 | 0.2844 | 20001 | 20000 |
| TP[3,4] | 0.305 | 0.1868 | 2.63E-03 | 3.59E-02 | 0.275 | 0.7343 | 20001 | 20000 |
| d[2] | -0.525 | 0.4845 | 0.00807 | -1.49 | -0.5189 | 0.4312 | 20001 | 20000 |
| d[3] | -0.5556 | 0.5156 | 0.008458 | -1.554 | -0.5561 | 0.4564 | 20001 | 20000 |
| sd | 0.2346 | 0.1792 | 0.002001 | 0.009872 | 0.1972 | 0.6674 | 20001 | 20000 |
| totresdev | 12.1 | 3.551 | 3.91E-02 | 7.2 | 11.44 | 20.74 | 20001 | 20000 |
| z[2] | 0.08232 | 0.05716 | 3.99E-04 | 0.01025 | 0.06939 | 0.2258 | 20001 | 20000 |
| z[3] | 0.5844 | 0.1487 | 1.08E-03 | 0.3254 | 0.5746 | 0.9043 | 20001 | 20000 |

**Table 66: DIC**

| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 38.302 | 32.585 | 5.717 | 44.019 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 39.689 | 33.972 | 5.717 | 45.406 |

### 4.5.4 High Response

**Table 67: Summary Statistics**

| node | mean | sd | MC error | 2.50% | median | 97.50% | start | sample |
|---|---|---|---|---|---|---|---|---|
| A | 0.1649 | 0.2908 | 0.002041 | -0.4033 | 0.1651 | 0.7337 | 20001 | 20000 |
| T[1,1] | 0.4371 | 0.1102 | 7.70E-04 | 0.2318 | 0.4344 | 0.6566 | 20001 | 20000 |
| T[1,2] | 0.5481 | 0.1939 | 0.002366 | 0.1633 | 0.5553 | 0.8957 | 20001 | 20000 |
| T[1,3] | 0.2763 | 0.1657 | 0.002065 | 0.03555 | 0.2513 | 0.6602 | 20001 | 20000 |
| T[2,1] | 0.4025 | 0.1097 | 7.70E-04 | 0.2019 | 0.3992 | 0.6236 | 20001 | 20000 |
| T[2,2] | 0.5159 | 0.1954 | 0.002381 | 0.1417 | 0.5197 | 0.8778 | 20001 | 20000 |
| T[2,3] | 0.2502 | 0.159 | 0.001975 | 0.02829 | 0.2228 | 0.6302 | 20001 | 20000 |
| T[3,1] | 0.3229 | 0.105 | 7.63E-04 | 0.1409 | 0.3157 | 0.543 | 20001 | 20000 |
| T[3,2] | 0.4386 | 0.1947 | 2.39E-03 | 0.0945 | 0.4302 | 0.8282 | 20001 | 20000 |
| T[3,3] | 0.1931 | 0.1413 | 1.76E-03 | 1.61E-02 | 0.1618 | 0.5467 | 20001 | 20000 |
| TP[1,1] | 0.5629 | 0.1102 | 7.70E-04 | 0.3434 | 0.5656 | 0.7684 | 20001 | 20000 |
| TP[1,2] | 0.03458 | 0.01941 | 1.38E-04 | 0.007418 | 0.031 | 0.08108 | 20001 | 20000 |
| TP[1,3] | 0.07964 | 0.02961 | 2.03E-04 | 0.03219 | 0.0761 | 0.1466 | 20001 | 20000 |
| TP[1,4] | 0.3229 | 0.105 | 7.63E-04 | 0.1409 | 0.3157 | 0.543 | 20001 | 20000 |
| TP[2,1] | 0.4519 | 0.1939 | 0.002366 | 0.1043 | 0.4447 | 0.8368 | 20001 | 20000 |
| TP[2,2] | 0.03211 | 0.01918 | 1.40E-04 | 0.005762 | 0.02836 | 0.07864 | 20001 | 20000 |
| TP[2,3] | 0.07731 | 0.03182 | 2.35E-04 | 0.02541 | 0.07379 | 0.15 | 20001 | 20000 |
| TP[2,4] | 0.4386 | 0.1947 | 2.39E-03 | 0.0945 | 0.4302 | 0.8282 | 20001 | 20000 |
| TP[3,1] | 0.7237 | 0.1657 | 0.002065 | 0.3399 | 0.7487 | 0.9645 | 20001 | 20000 |
| TP[3,2] | 0.02613 | 0.01753 | 1.48E-04 | 0.003573 | 0.02229 | 0.06966 | 20001 | 20000 |
| TP[3,3] | 0.05703 | 0.03058 | 2.89E-04 | 0.009983 | 0.0531 | 0.1267 | 20001 | 20000 |
| TP[3,4] | 0.1931 | 0.1413 | 1.76E-03 | 1.61E-02 | 0.1618 | 0.5467 | 20001 | 20000 |
| d[2] | -0.3031 | 0.4837 | 0.006451 | -1.262 | -0.3036 | 0.6527 | 20001 | 20000 |
| d[3] | 0.5151 | 0.4811 | 0.006646 | -0.4143 | 0.5041 | 1.479 | 20001 | 20000 |
| sd | 0.2745 | 0.1958 | 0.002108 | 0.01083 | 0.2419 | 0.7258 | 20001 | 20000 |
| totresdev | 13.09 | 3.652 | 3.59E-02 | 7.654 | 12.49 | 21.71 | 20001 | 20000 |
| z[2] | 0.09252 | 0.05193 | 3.71E-04 | 0.01994 | 0.08303 | 0.2167 | 20001 | 20000 |
| z[3] | 0.3157 | 0.09474 | 7.06E-04 | 0.1569 | 0.307 | 0.5252 | 20001 | 20000 |

**Table 68: DIC**

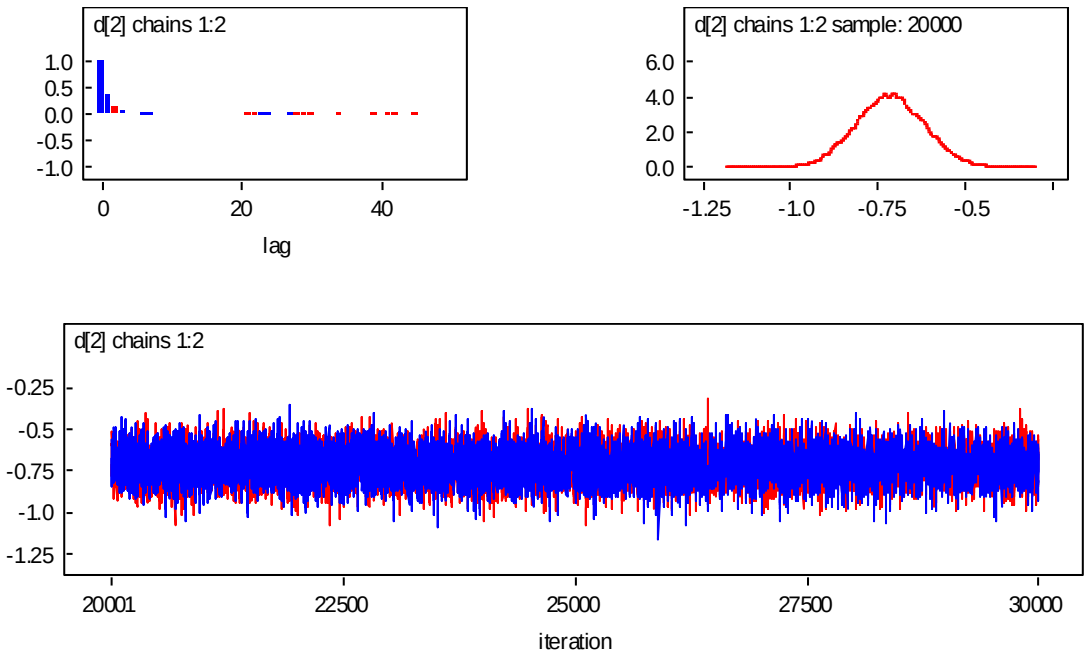
| | Dbar | Dhat | pD | DIC |
|---|---|---|---|---|
| r | 40.636 | 34.655 | 5.982 | 46.618 |
| sd | 1.386 | 1.386 | 0 | 1.386 |
| total | 42.023 | 36.041 | 5.982 | 48.005 |

# 5. Appendix A1 - Fixed-effect models

## 5.1 Week 0-2

### 5.1.1 Non-response

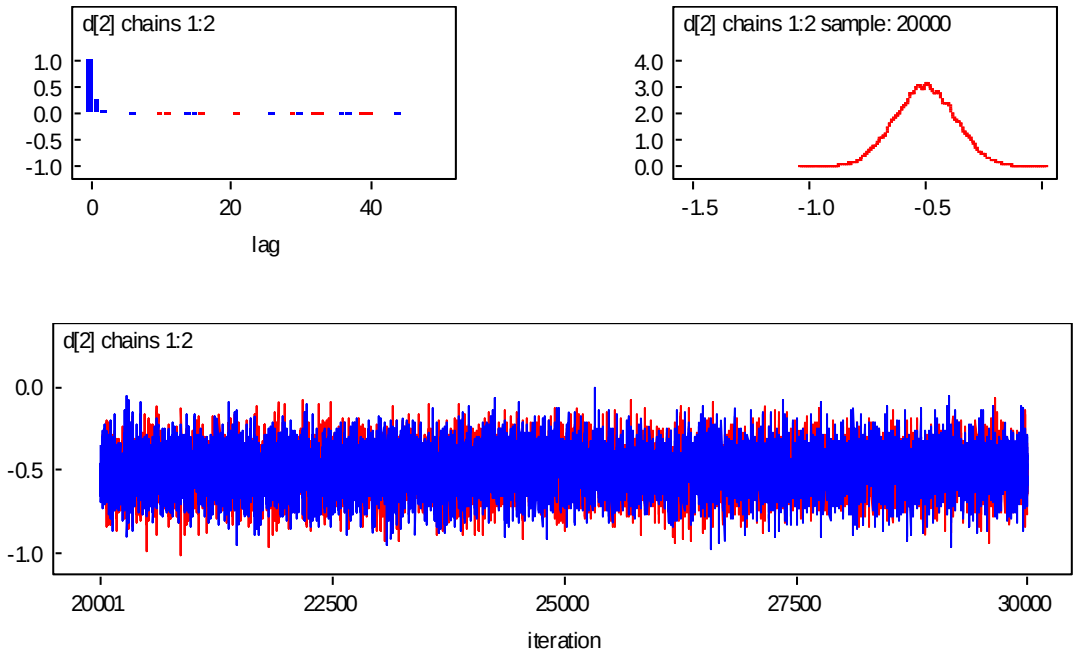
**Figure A1: Convergence, autocorrelation and density plots**



## 5.2 Week 2-4

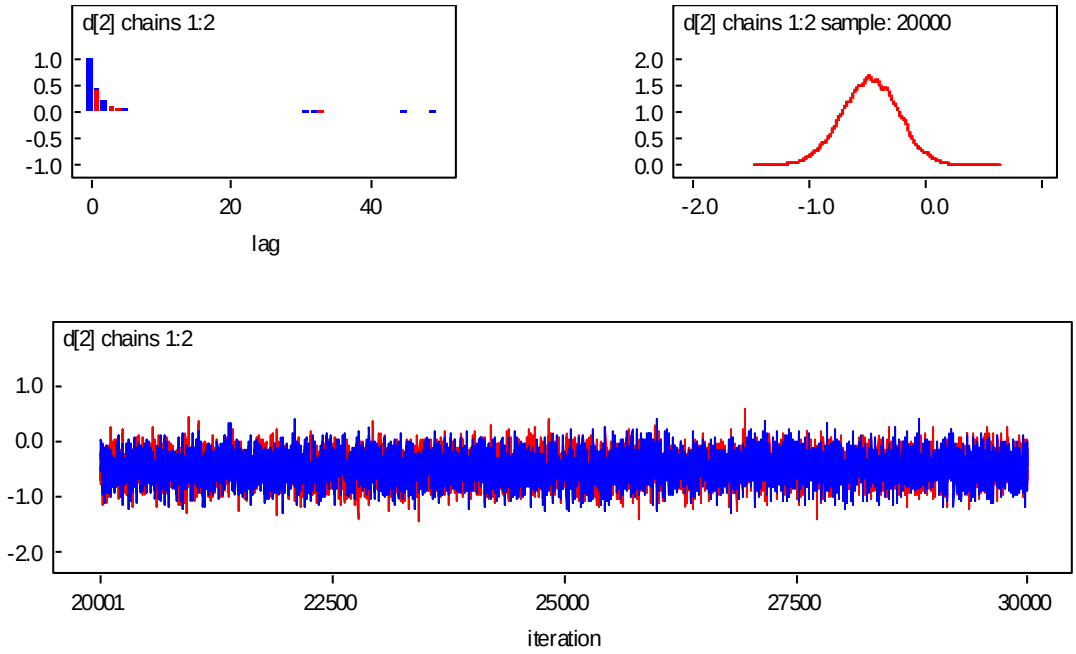
### 5.2.1 Non response

**Figure A2: Convergence, autocorrelation and density plots**



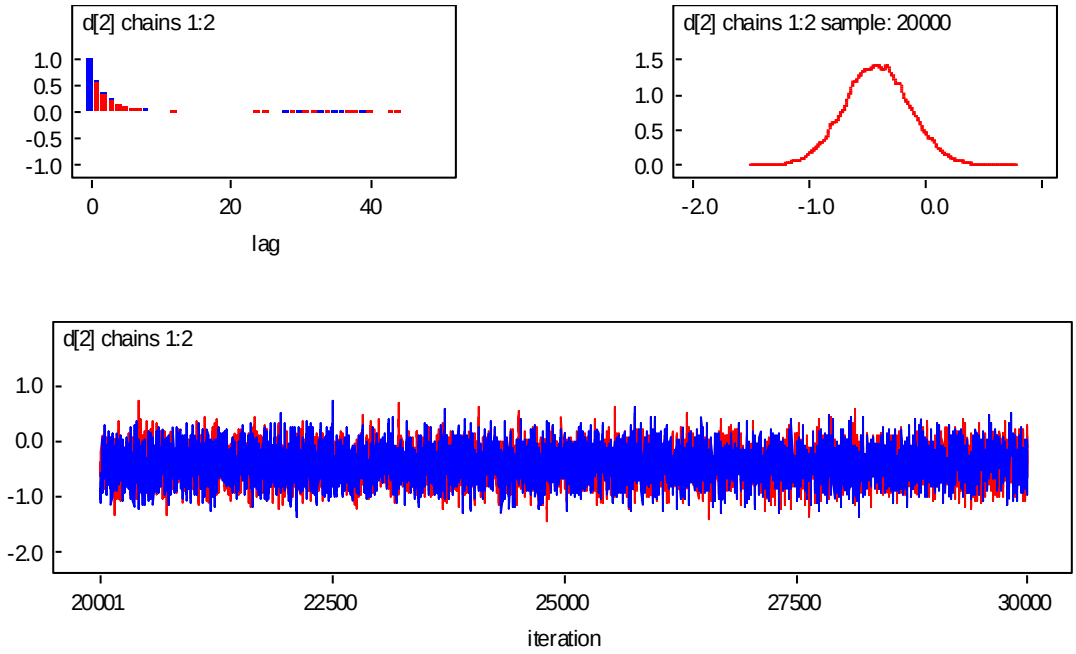
### 5.2.2 Partial response

**Figure A3: Convergence, autocorrelation and density plots**



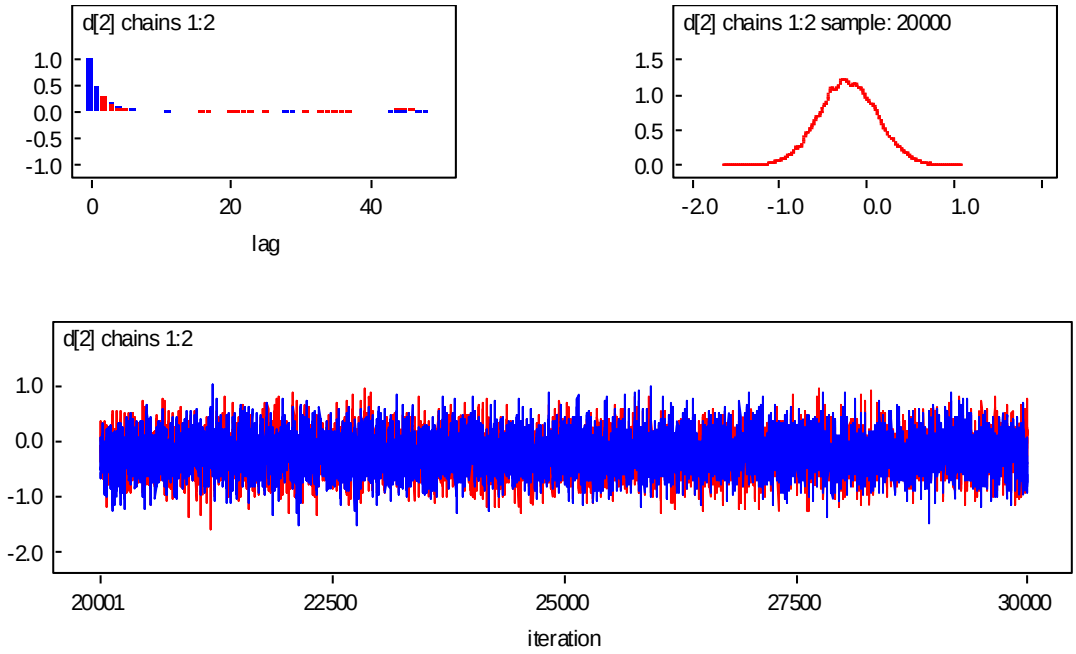
### 5.2.3 Response

**Figure A4: Convergence, autocorrelation and density plots**



### 5.2.4 High Response

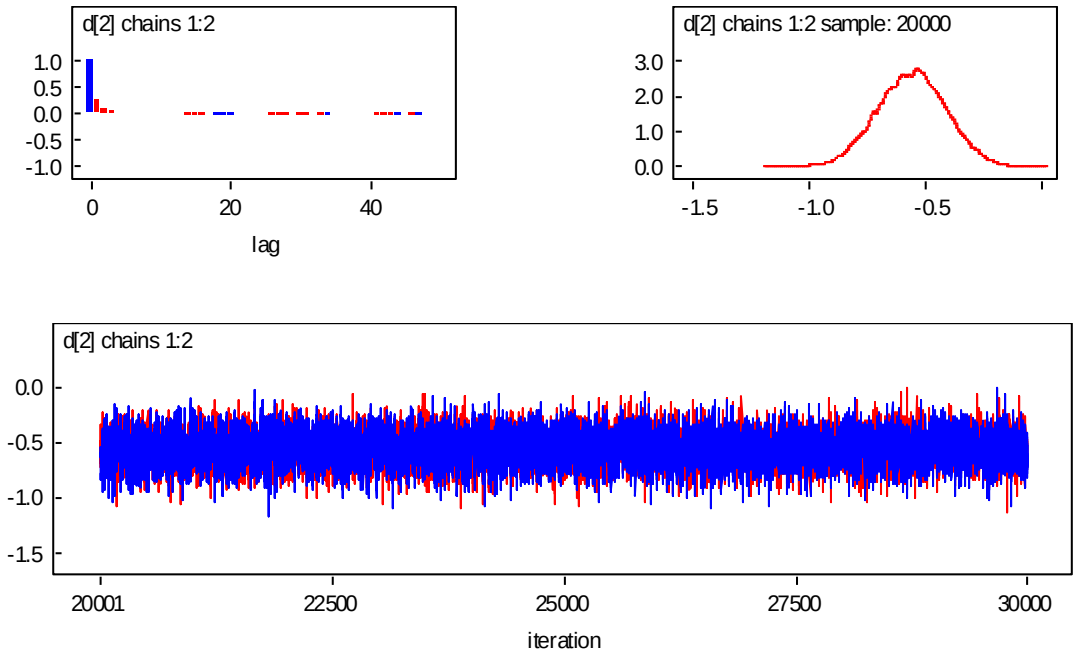
**Figure A5: Convergence, autocorrelation and density plots**



## 5.3 Week 4-8

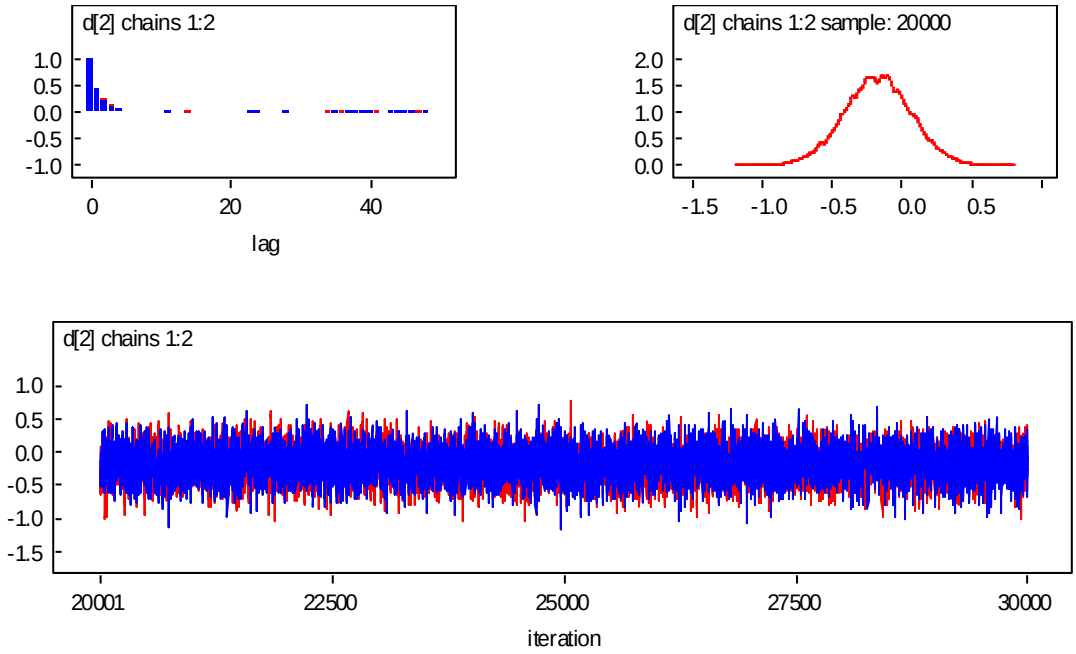
### 5.3.1 Non response

**Figure A6: Convergence, autocorrelation and density plots**



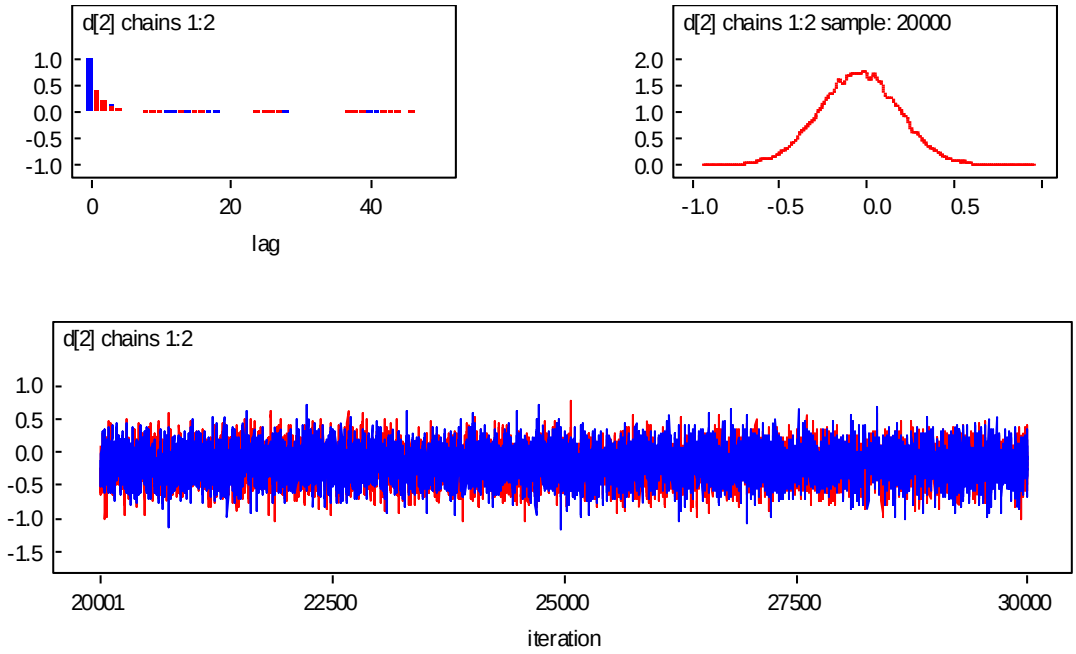
### 5.3.2 Partial response

**Figure A7: Convergence, autocorrelation and density plots**



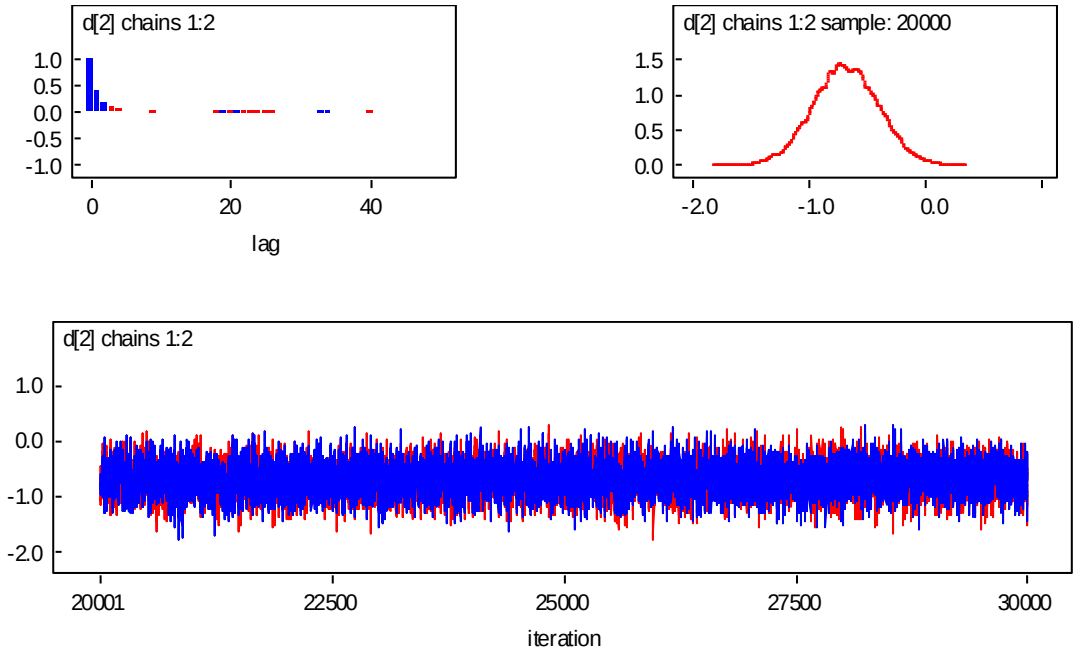
### 5.3.3 Response

**Figure A8: Convergence, autocorrelation and density plots**



### 5.3.4 High Response

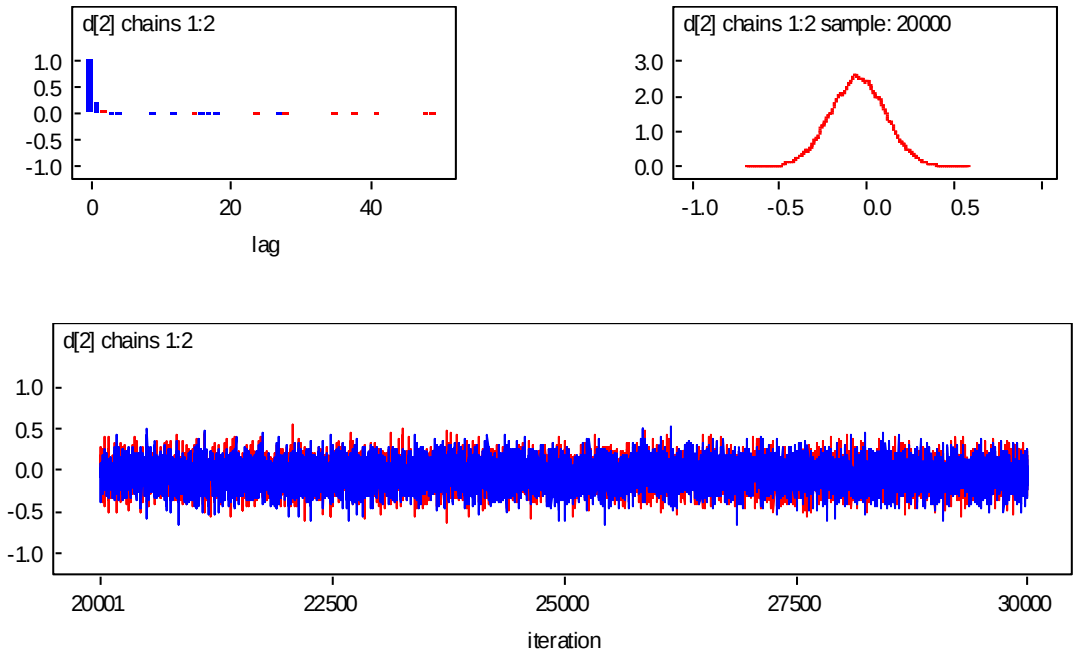
**Figure A9: Convergence, autocorrelation and density plots**



## 5.4 Week 8-12

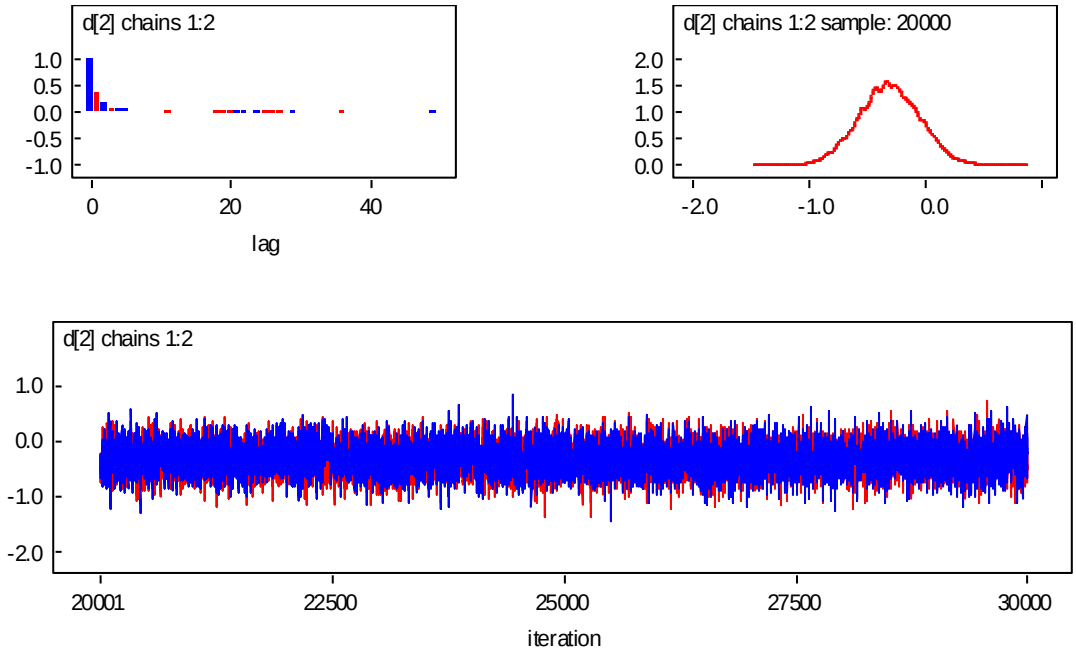
### 5.4.1 Non response

**Figure A10: Convergence, autocorrelation and density plots**



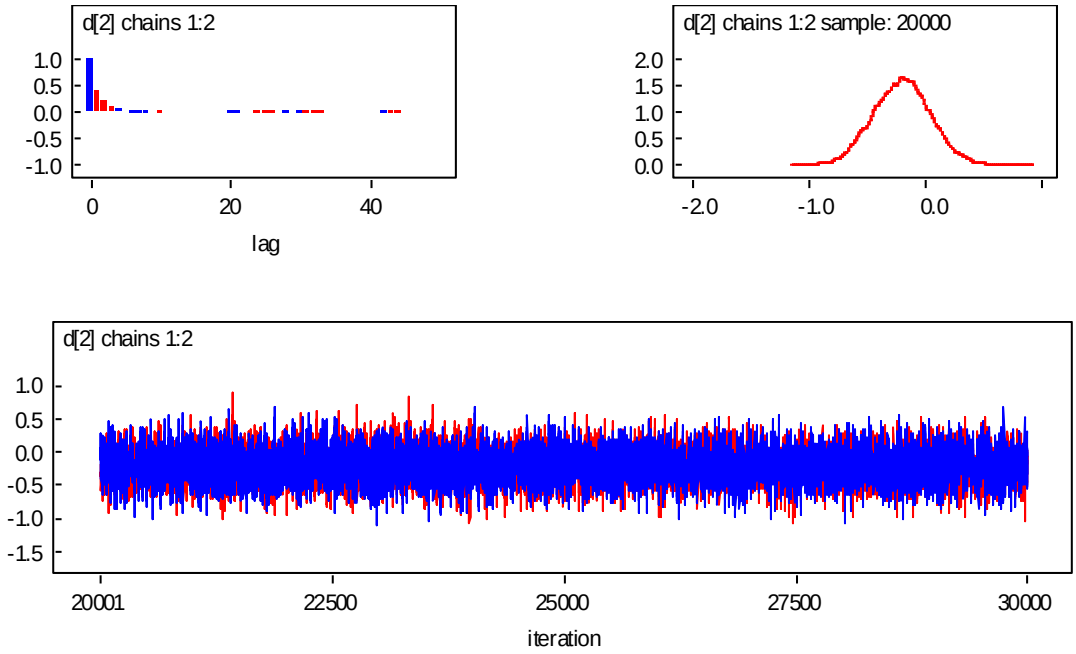
### 5.4.2 Partial response

**Figure A11: Convergence, autocorrelation and density plots**



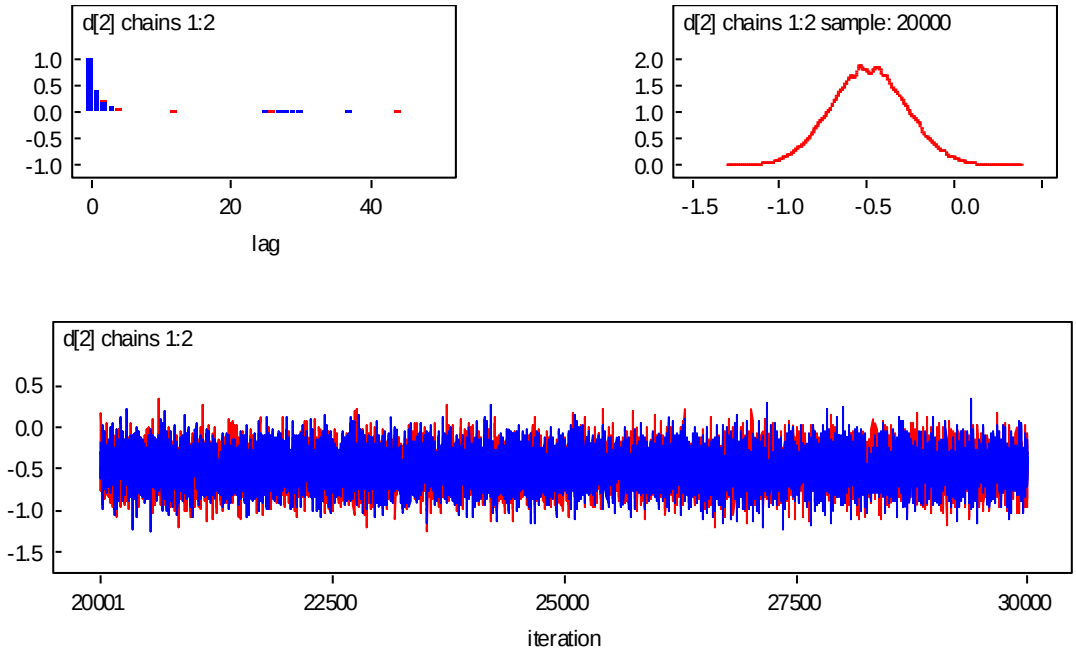
### 5.4.3 Response

**Figure A12: Convergence, autocorrelation and density plots**



### 5.4.4 High Response

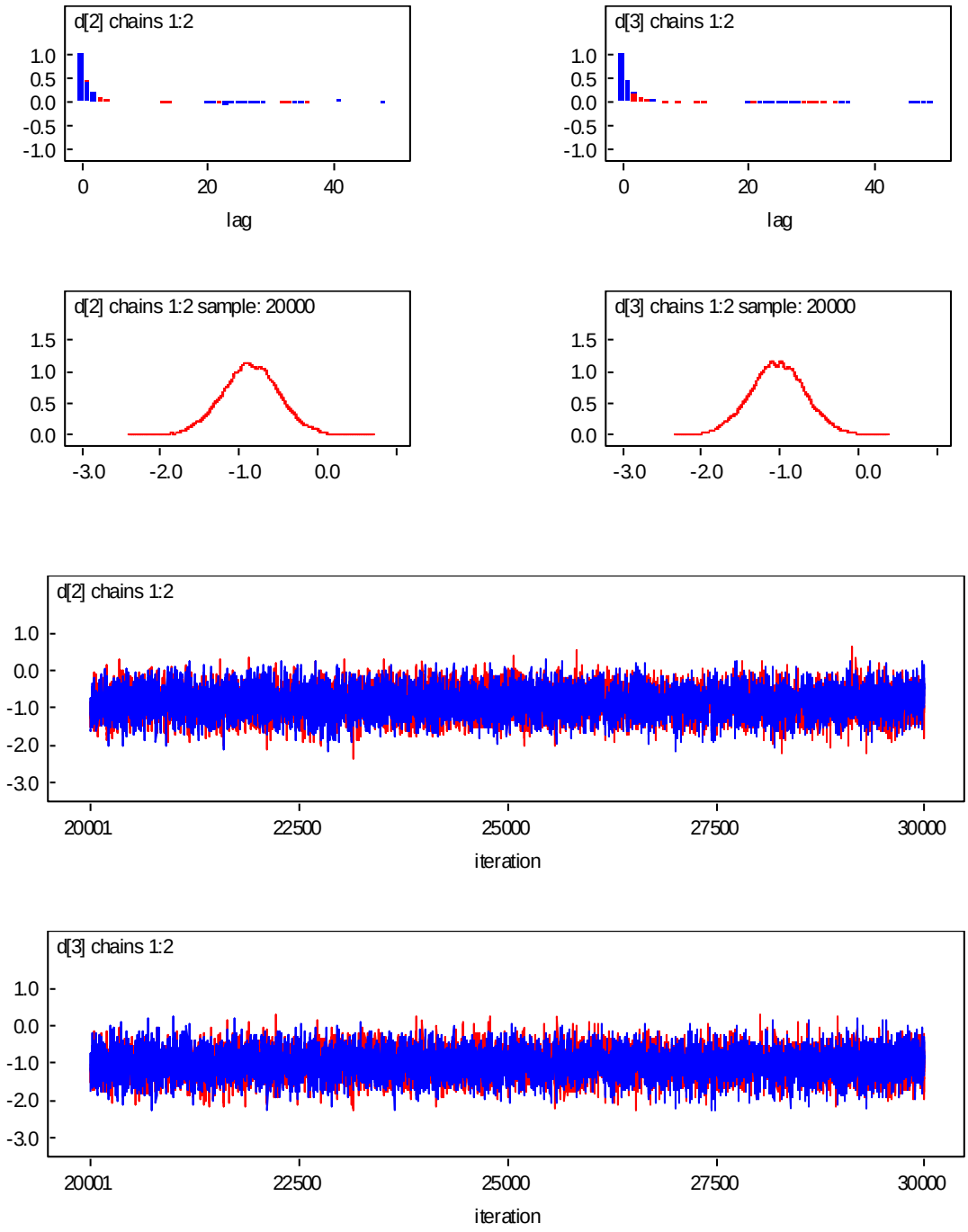
**Figure A13: Convergence, autocorrelation and density plots**



## 5.5 Week 12-36

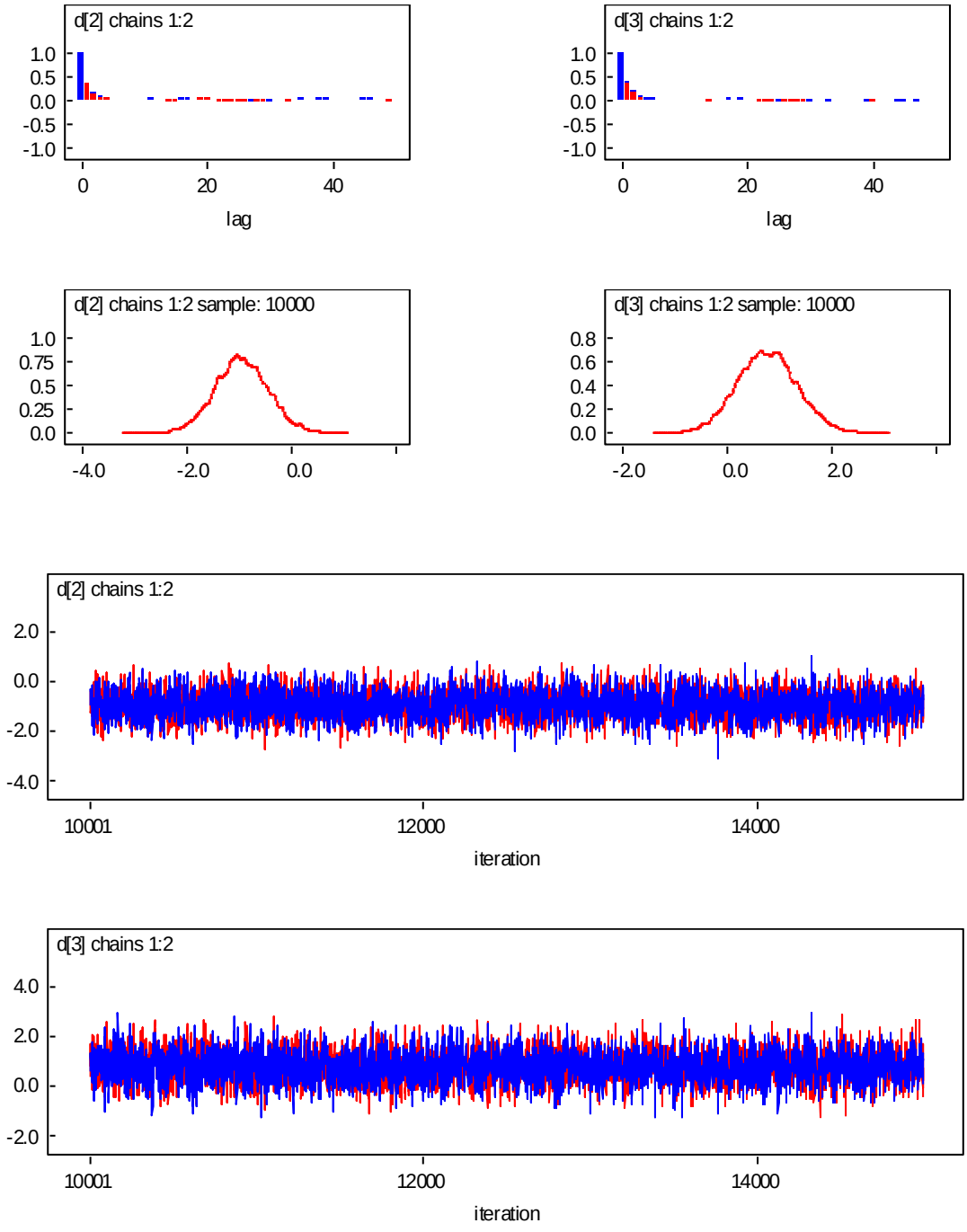
### 5.5.1 Non response

**Figure A14: Convergence, autocorrelation and density plots**



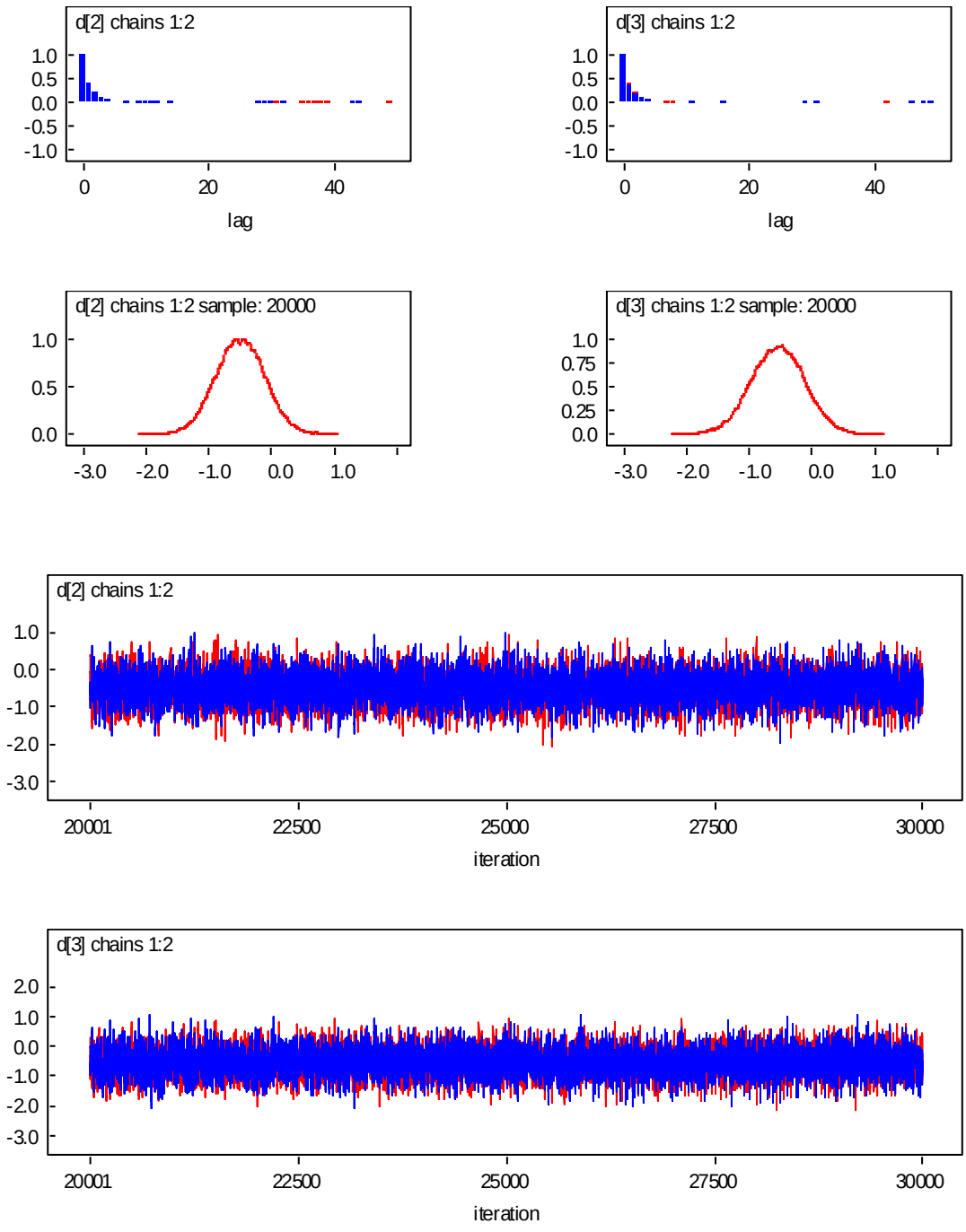
### 5.5.2 Partial response

**Figure A15: Convergence, autocorrelation and density plots**



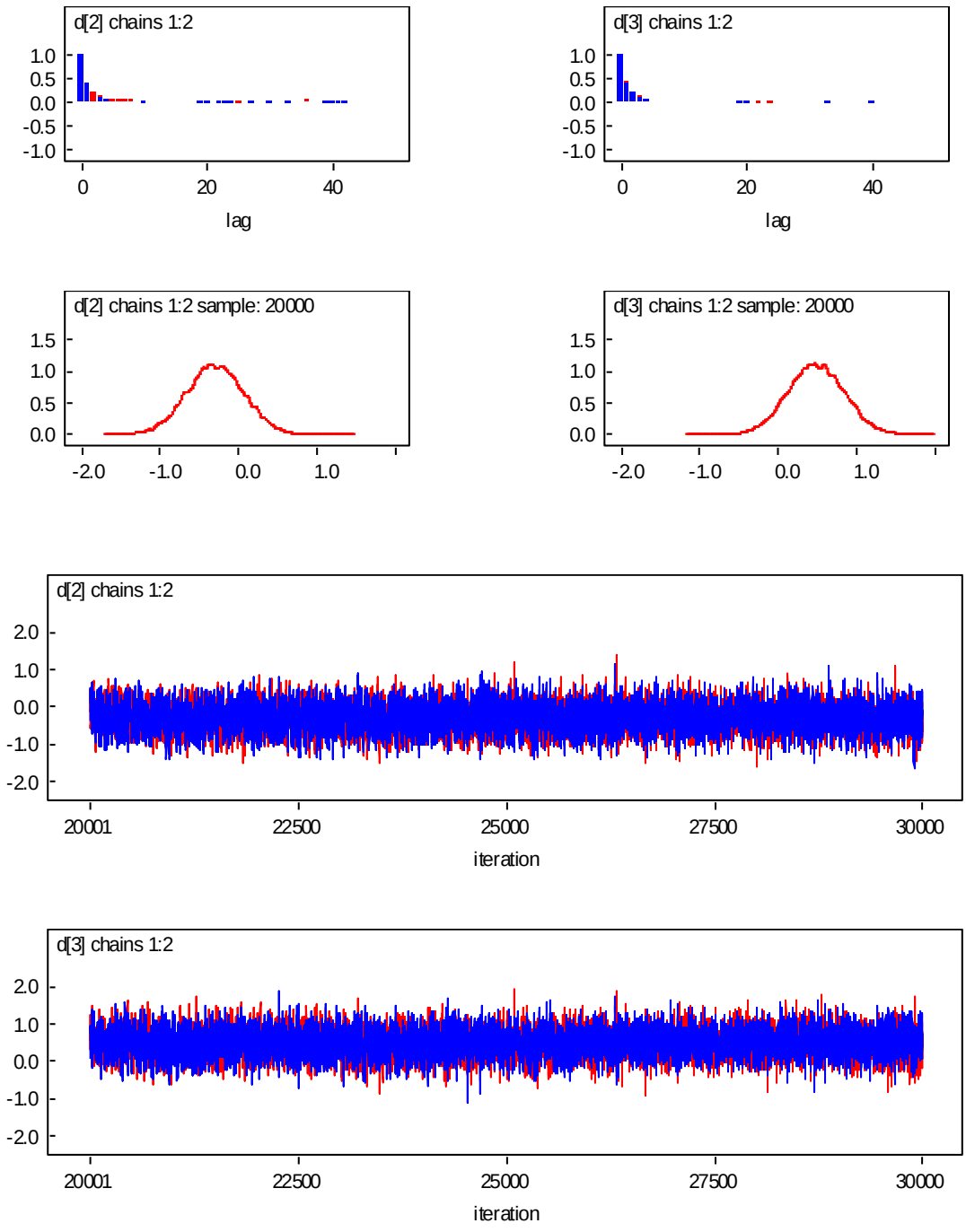
### 5.5.3 Response

**Figure A16: Convergence, autocorrelation and density plots**



### 5.5.4 High Response

**Figure A17: Convergence, autocorrelation and density plots**

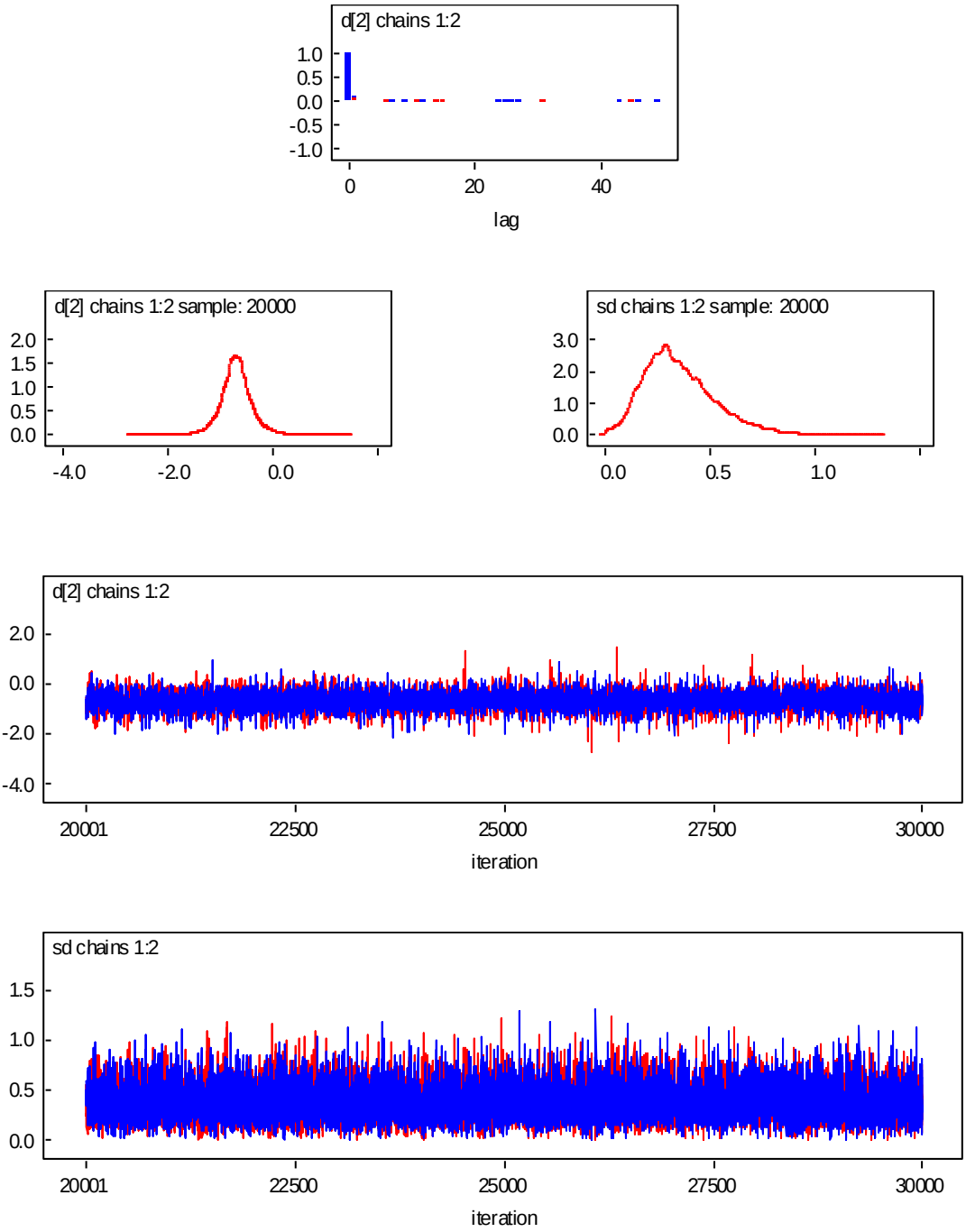


# 6. Appendix A2 - Random Effect models

## 6.1 Week 0-2

### 6.1.1 Non response

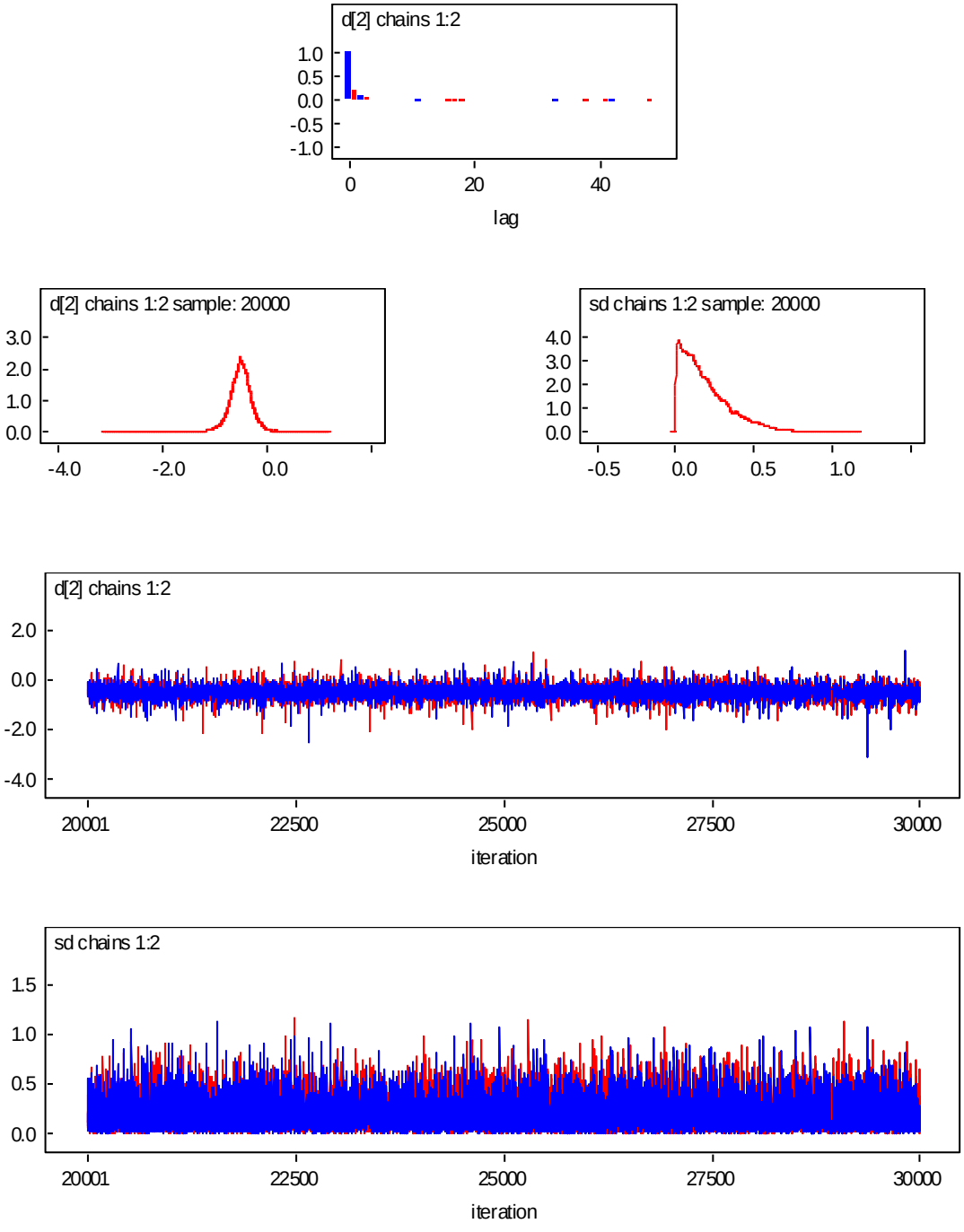
**Figure A18: Convergence, autocorrelation and density plots**



## 6.2 Week 2-4

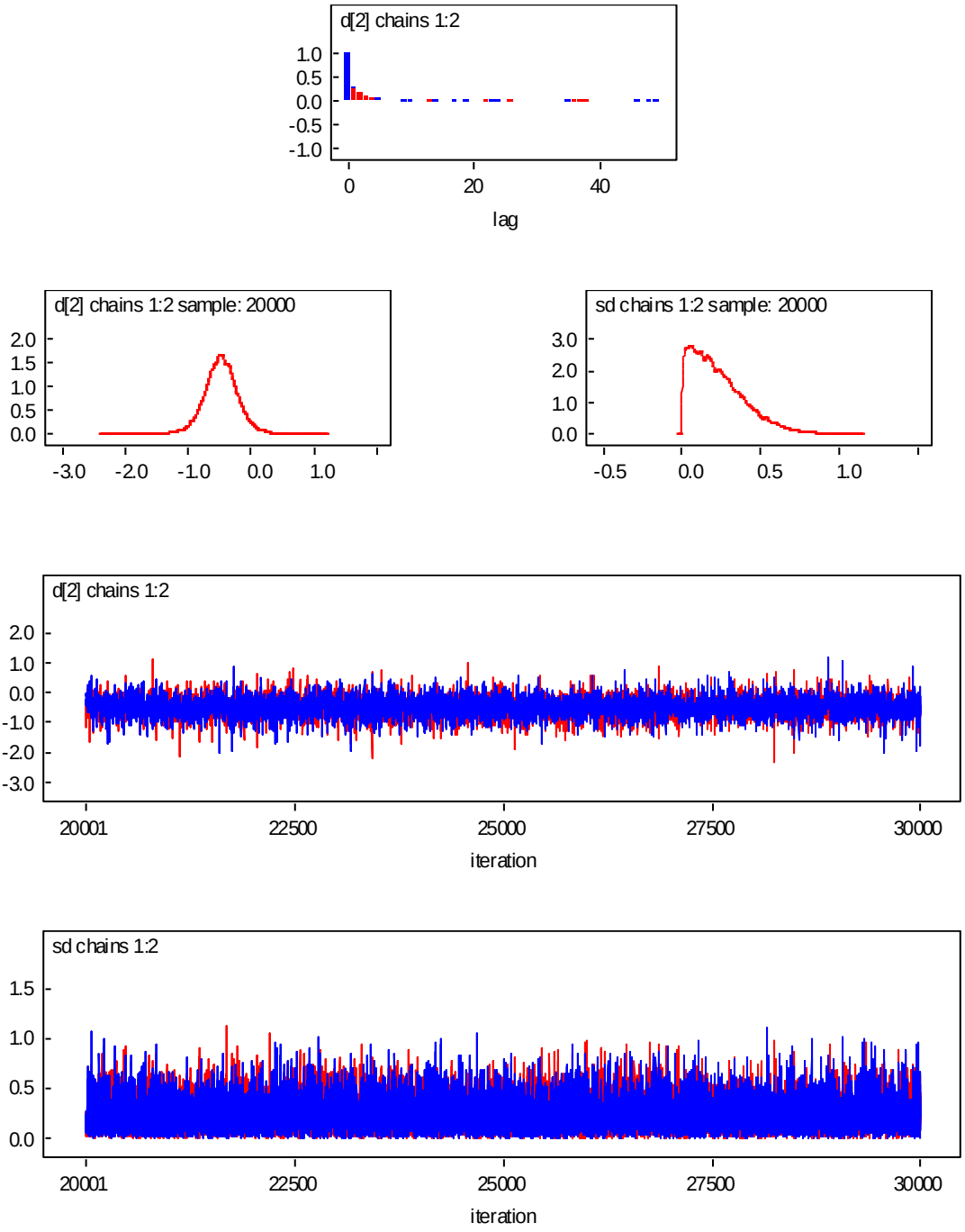
### 6.2.1 Non response

**Figure A19: Convergence, autocorrelation and density plots**



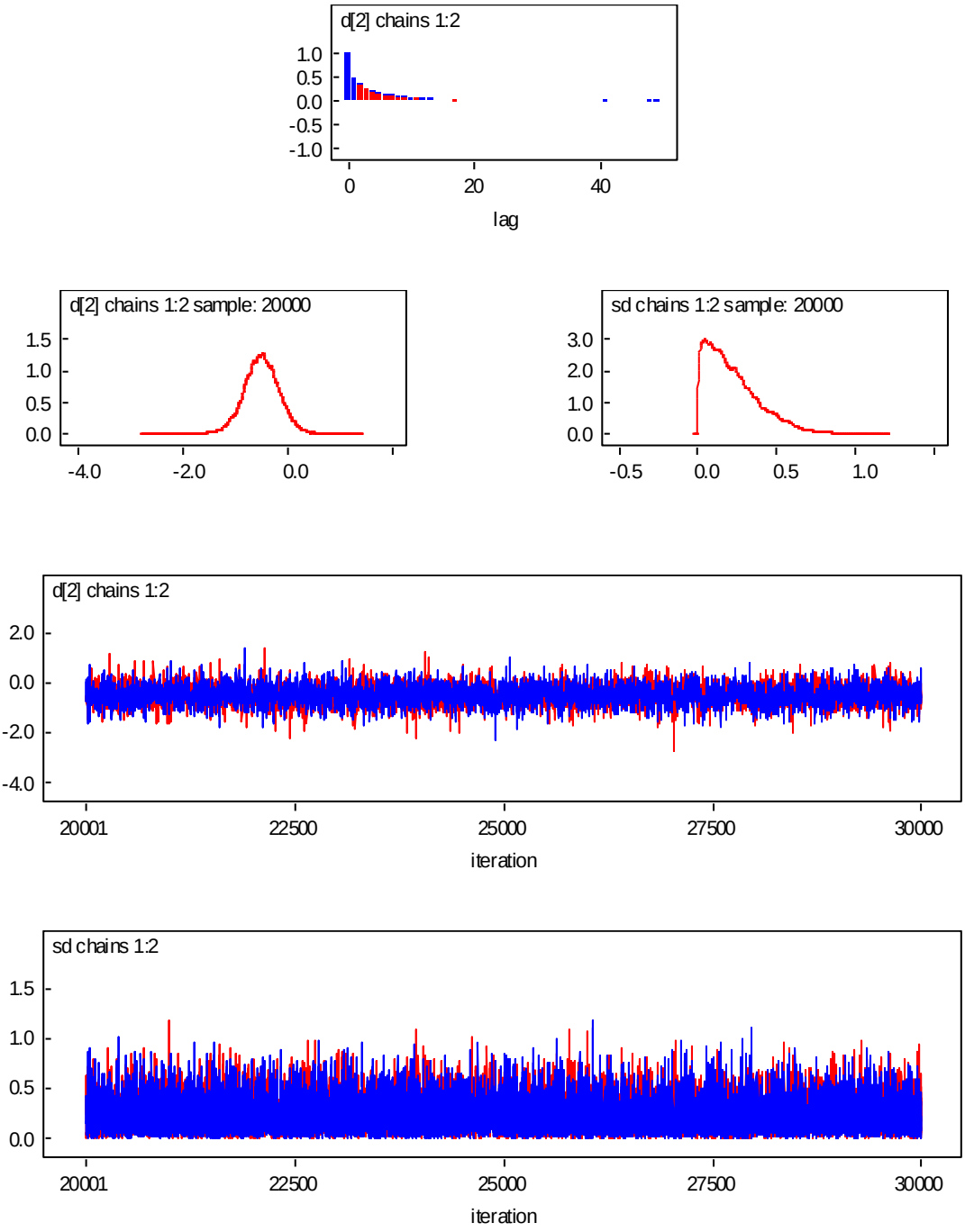
### 6.2.2 Partial response

**Figure A20: Convergence, autocorrelation and density plots**



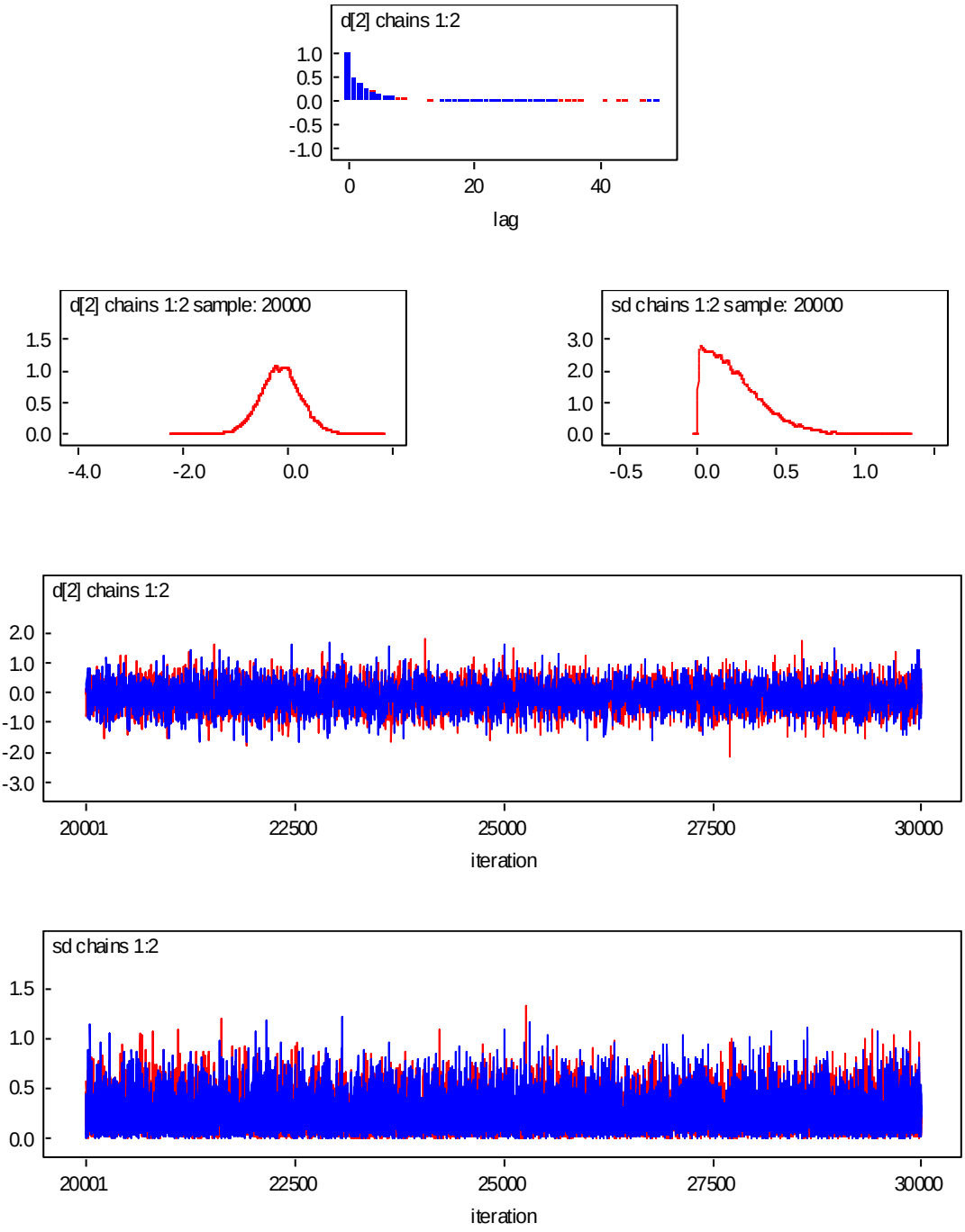
### 6.2.3 Response

**Figure A21: Convergence, autocorrelation and density plots**



### 6.2.4 High response

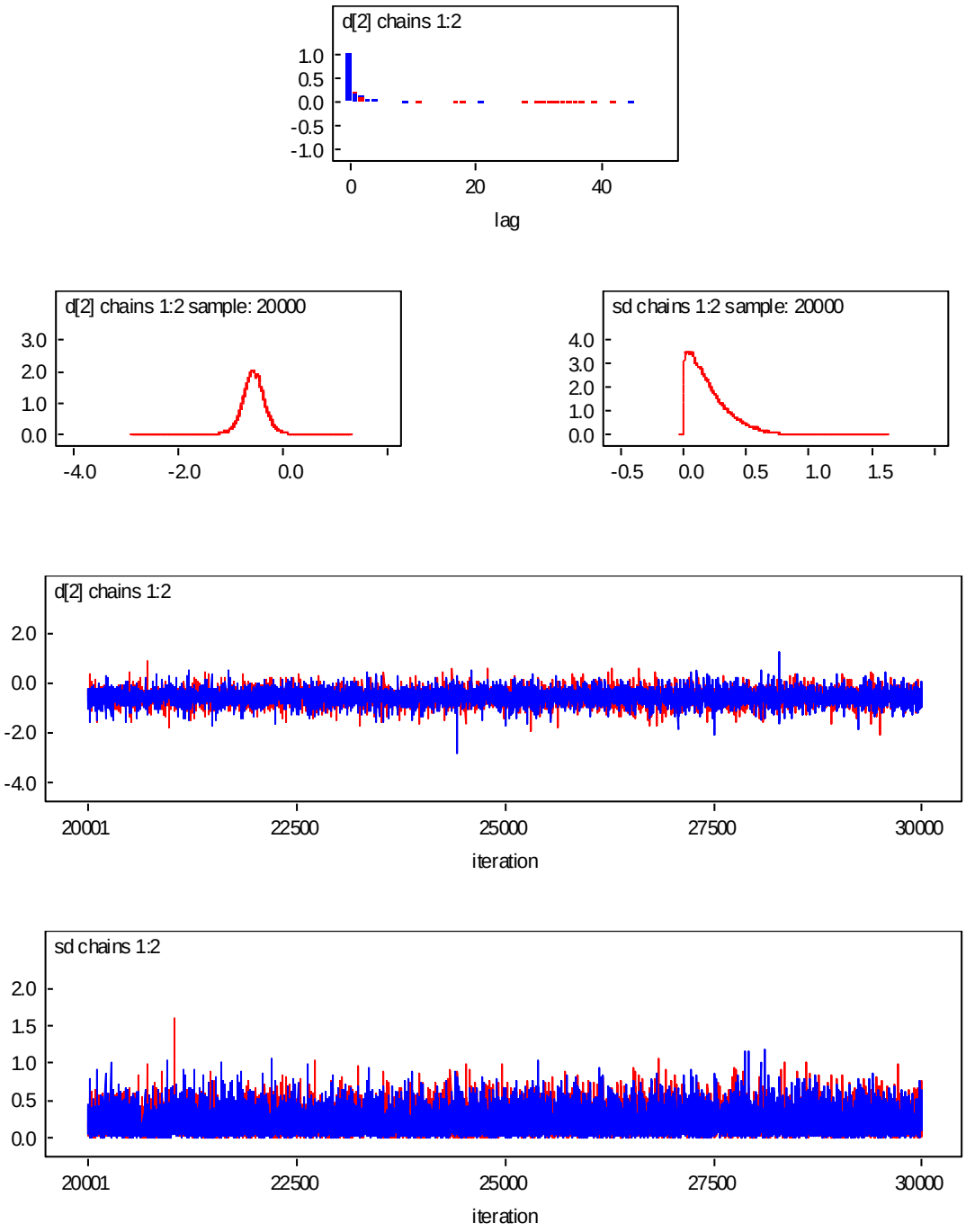
**Figure A22: Convergence, autocorrelation and density plots**



## 6.3 Week 4-8

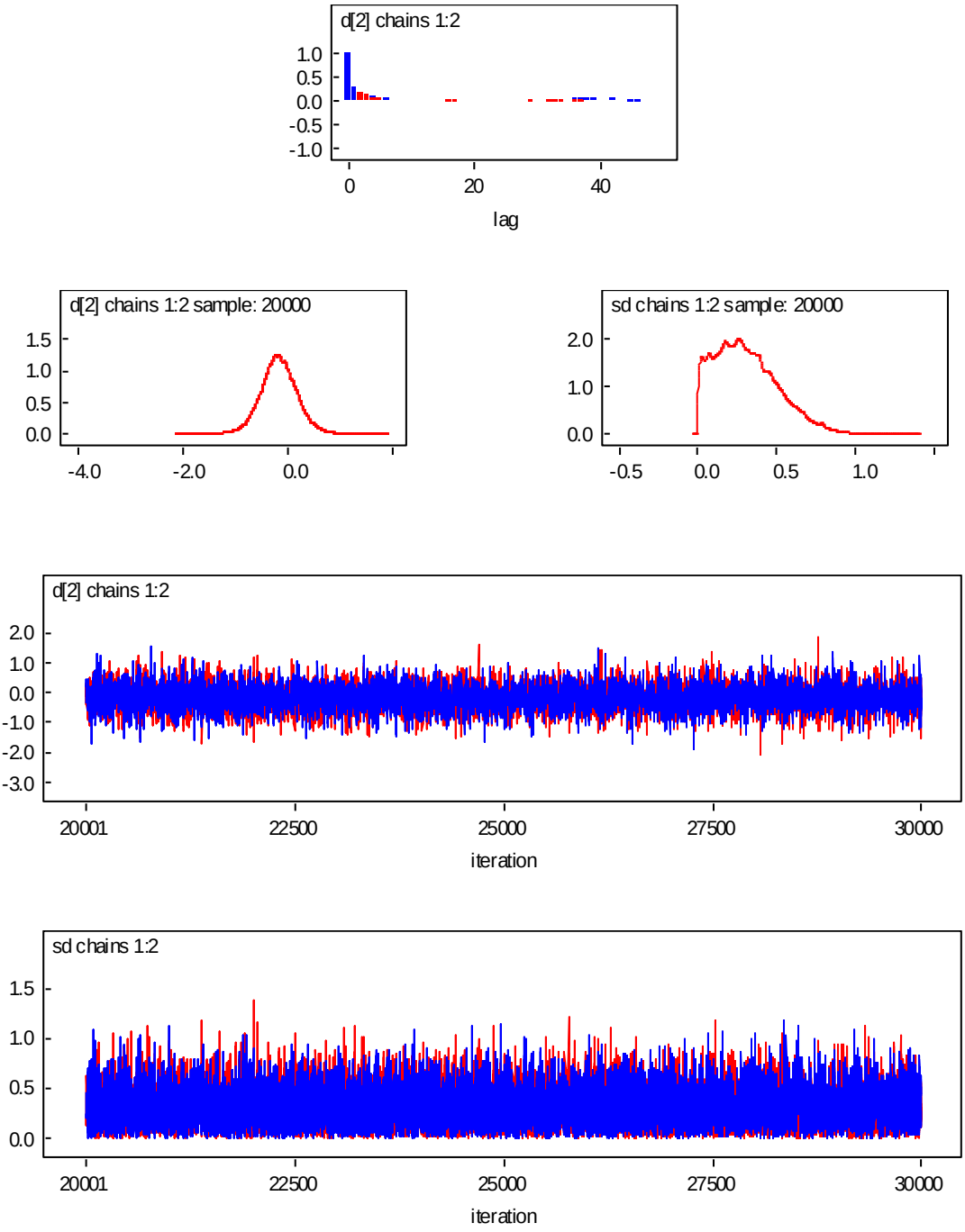
### 6.3.1 Non response

**Figure A23: Convergence, autocorrelation and density plots**



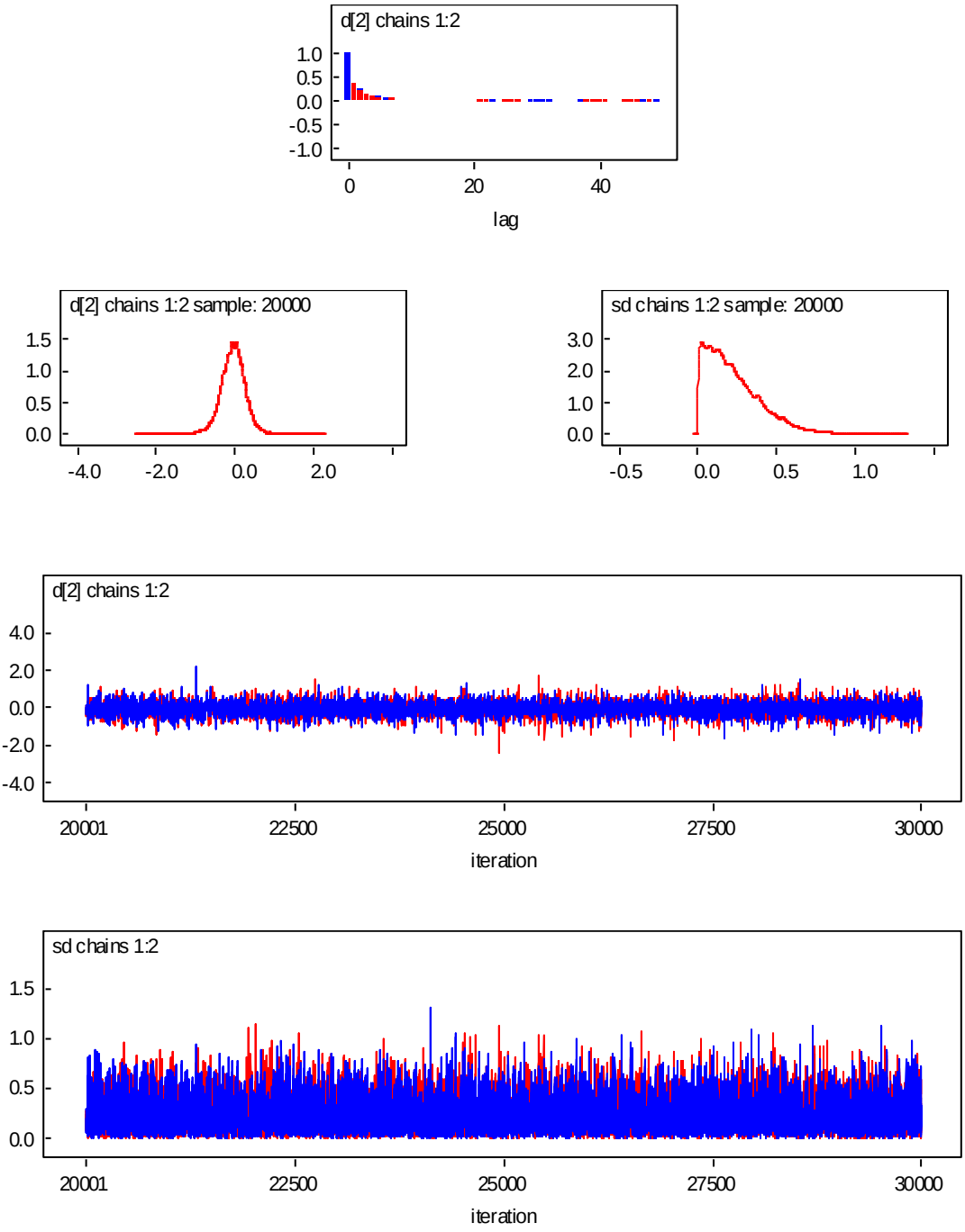
### 6.3.2 Partial response

**Figure A24: Convergence, autocorrelation and density plots**



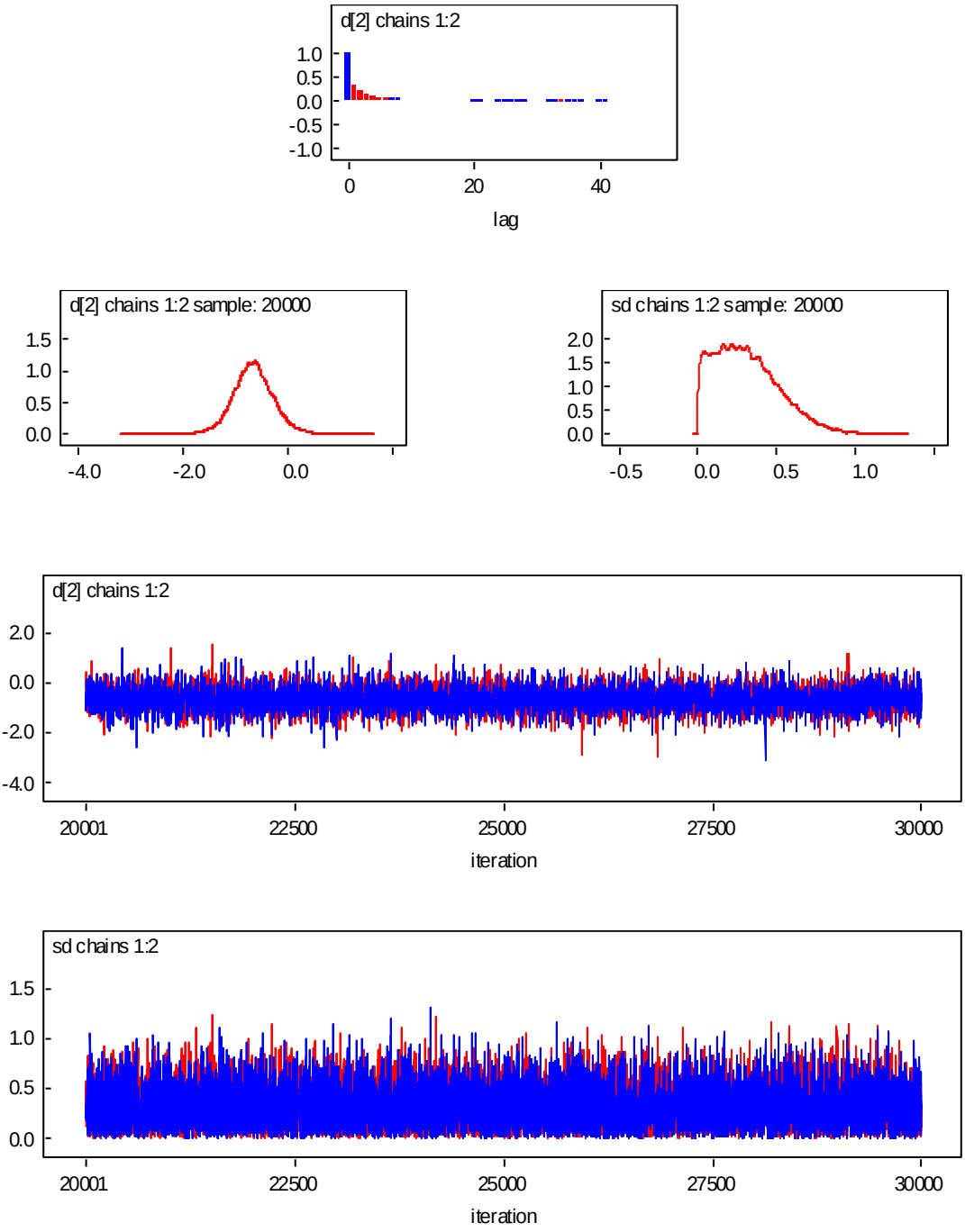
### 6.3.3 Response

**Figure A25: Convergence, autocorrelation and density plots**



### 6.3.4 High response

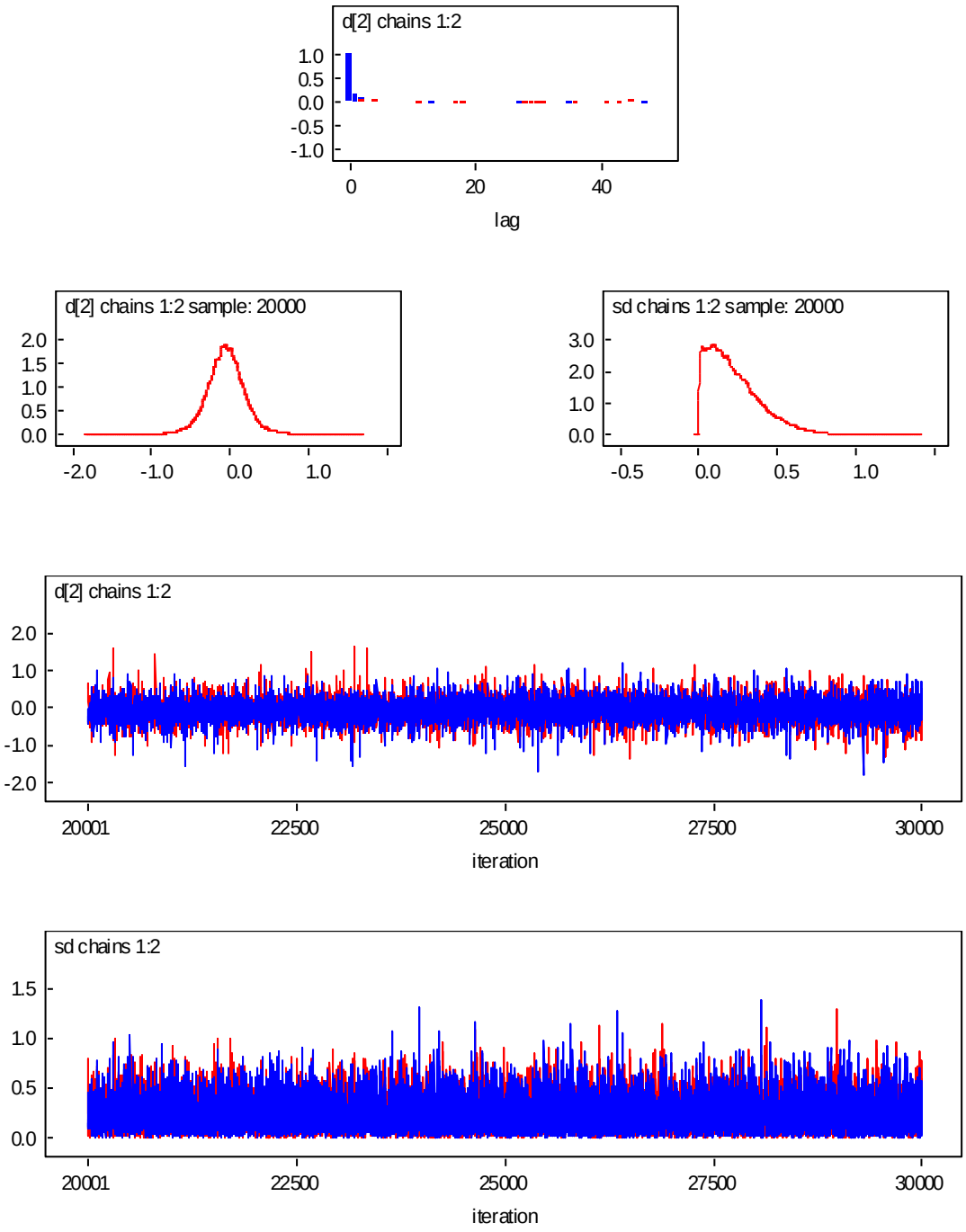
**Figure A26: Convergence, autocorrelation and density plots**



## 6.4 Week 8-12

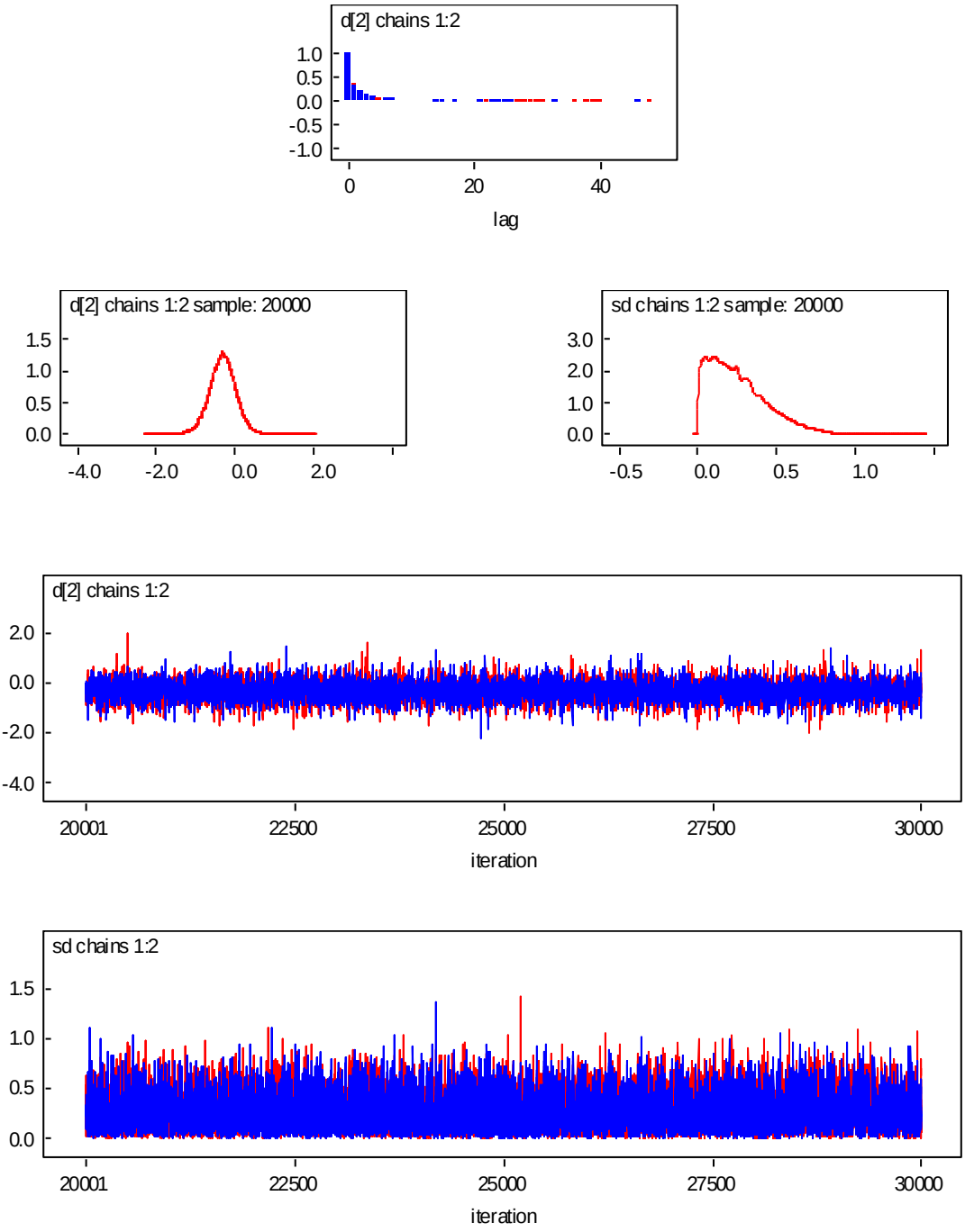
### 6.4.1 Non response

**Figure A27: Convergence, autocorrelation and density plots**



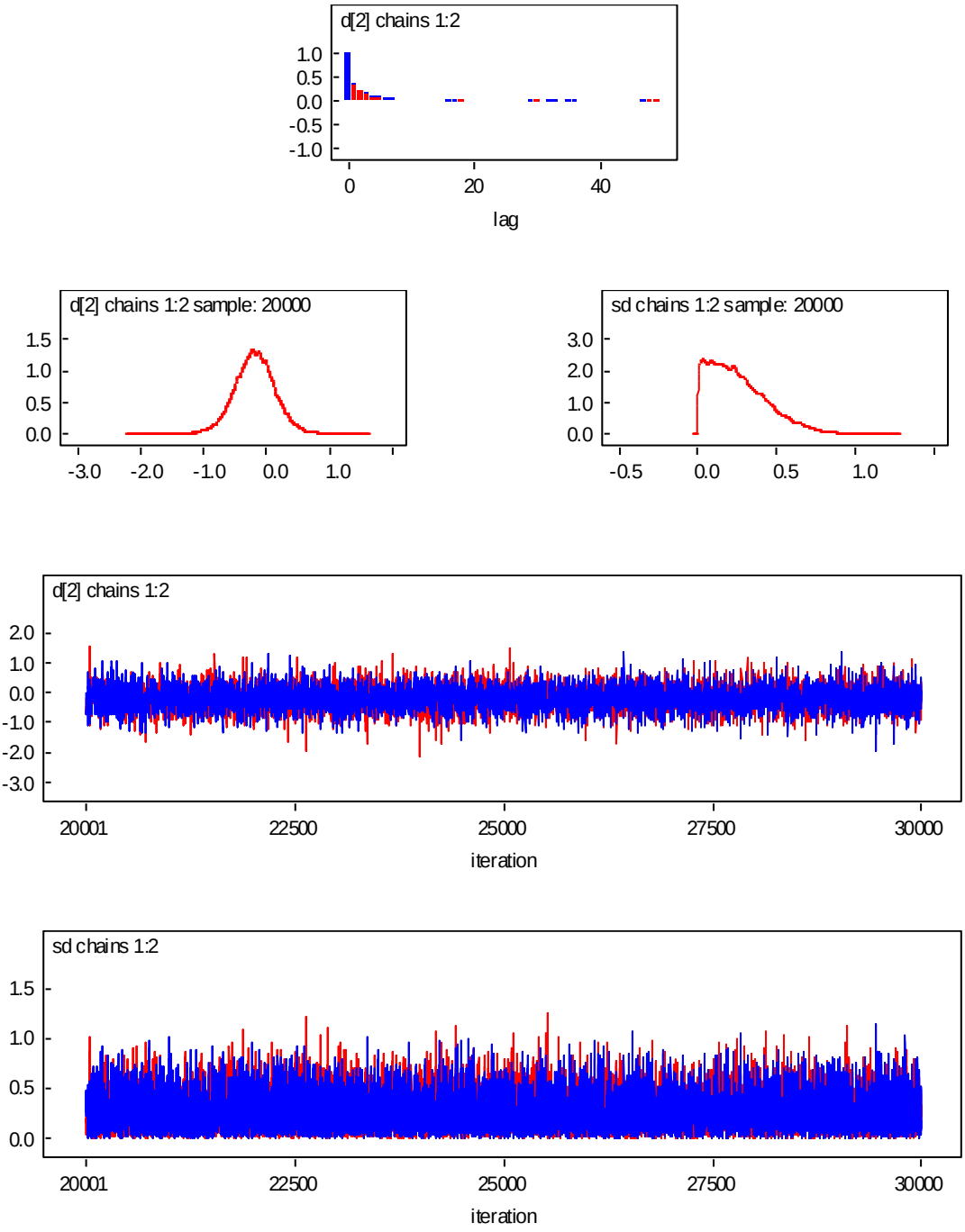
### 6.4.2 Partial response

**Figure A28: Convergence, autocorrelation and density plots**



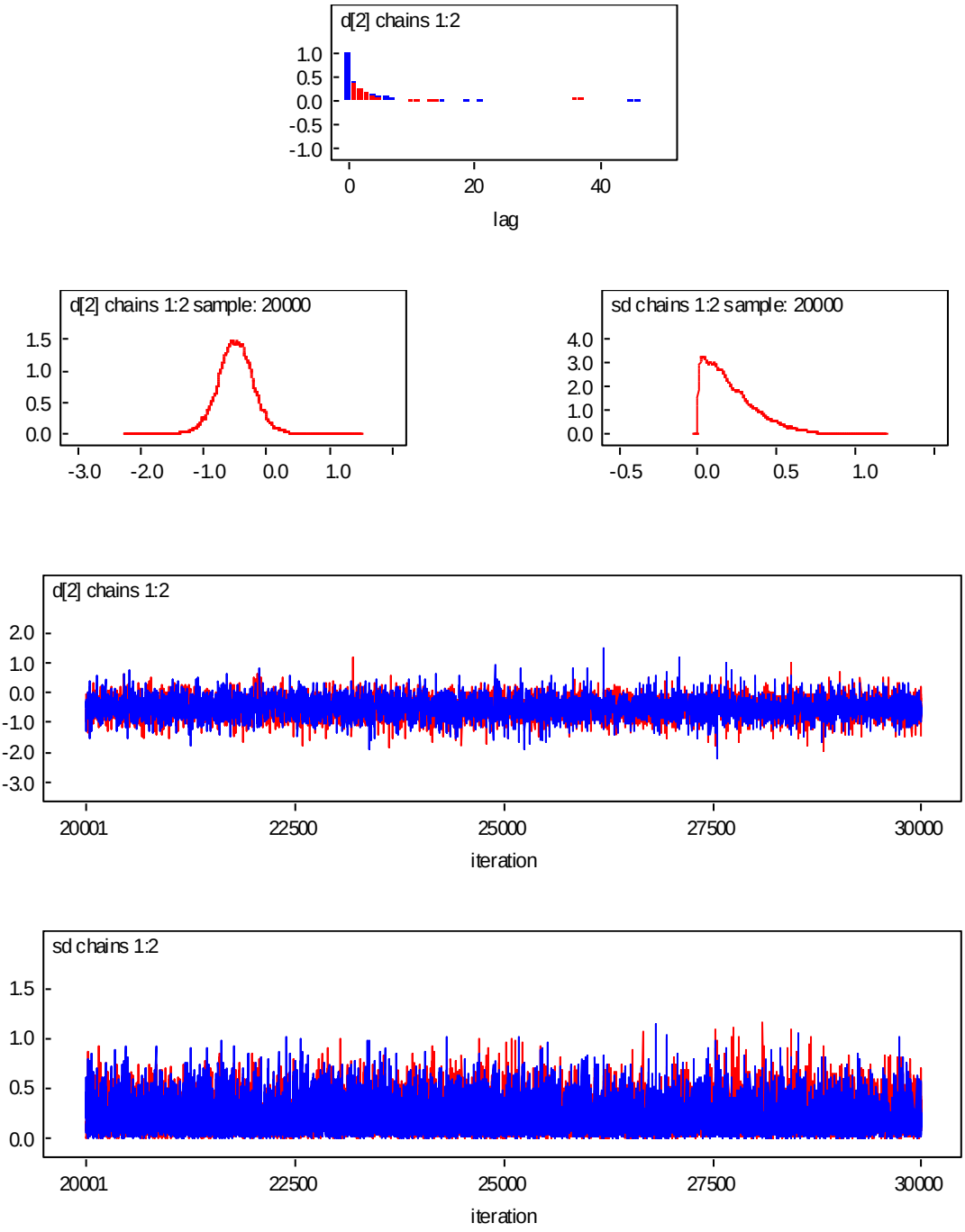
### 6.4.3 Response

**Figure A29: Convergence, autocorrelation and density plots**



### 6.4.4 High response

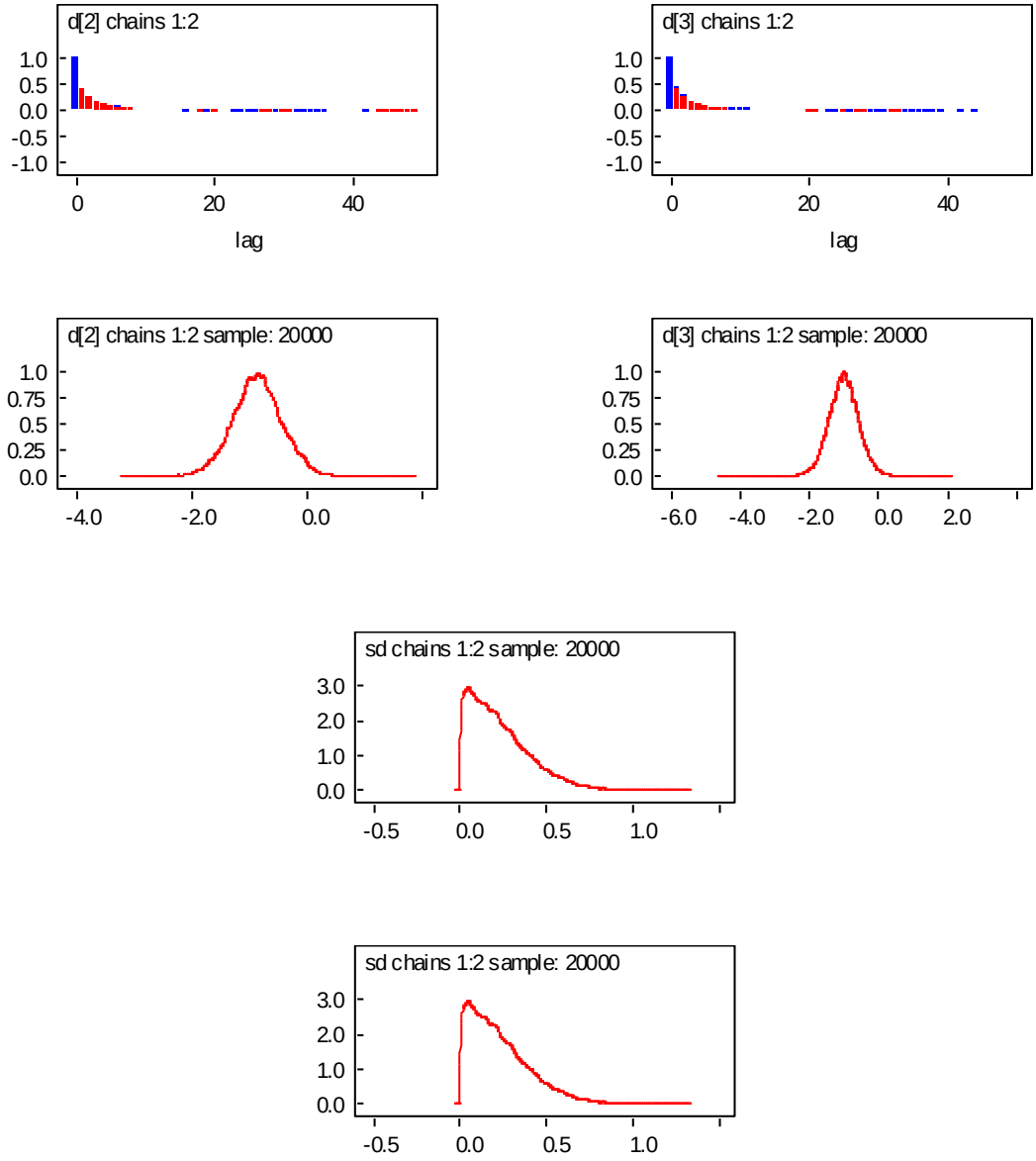
**Figure A30: Convergence, autocorrelation and density plots**

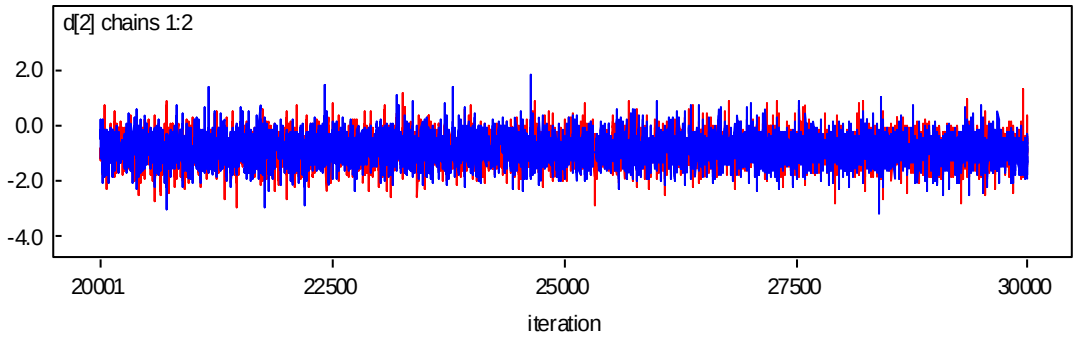


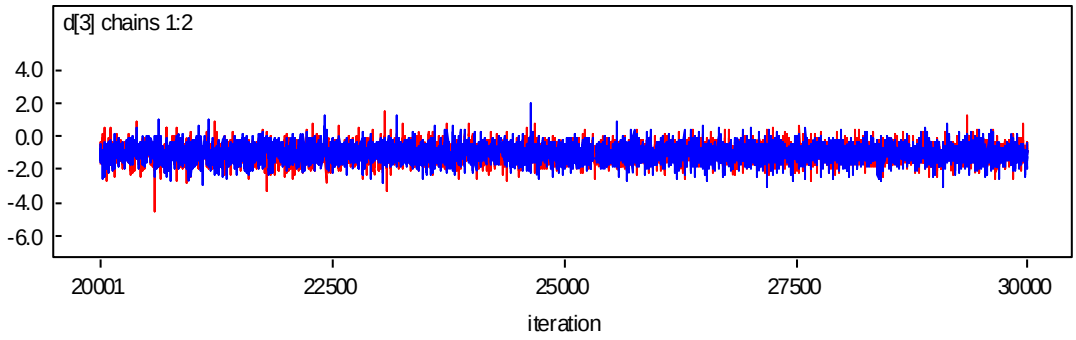
## 6.5 Week 12-36

### 6.5.1 Non response

**Figure A31: Convergence, autocorrelation and density plots**

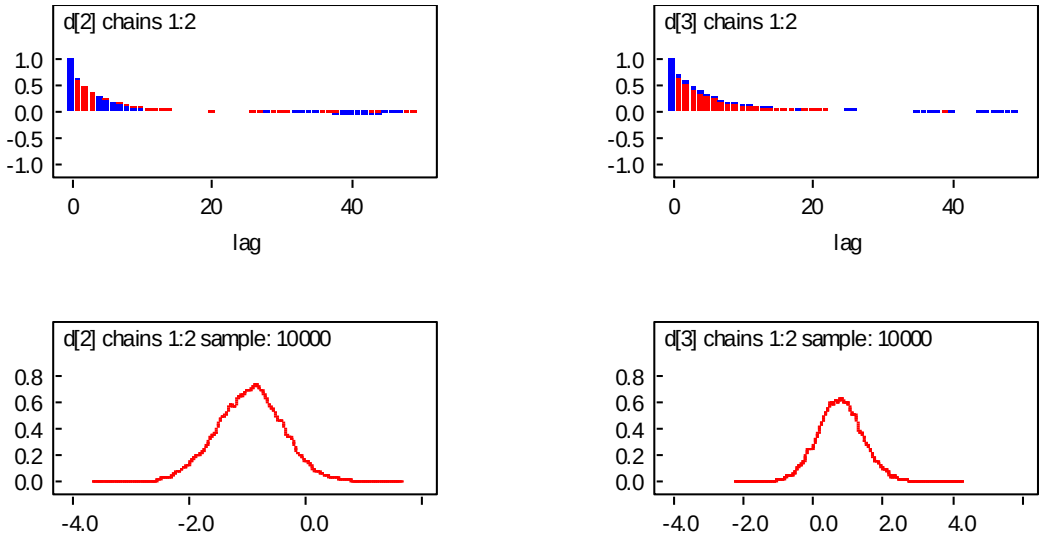


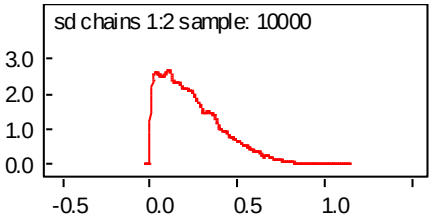


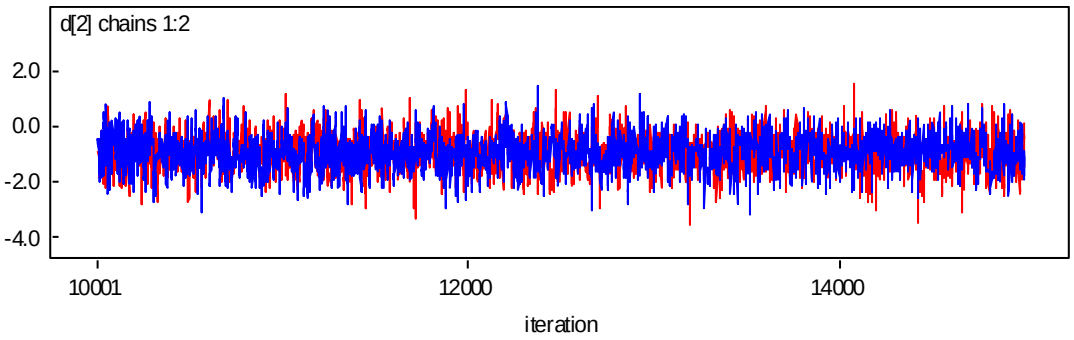



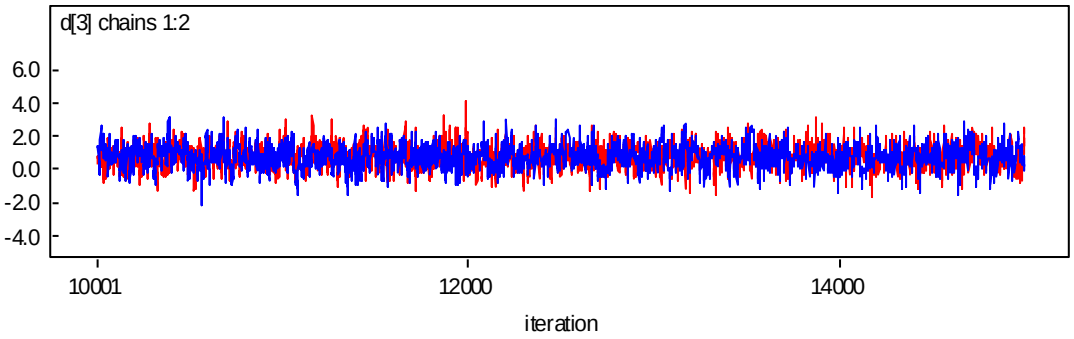

### 6.5.2 Partial response

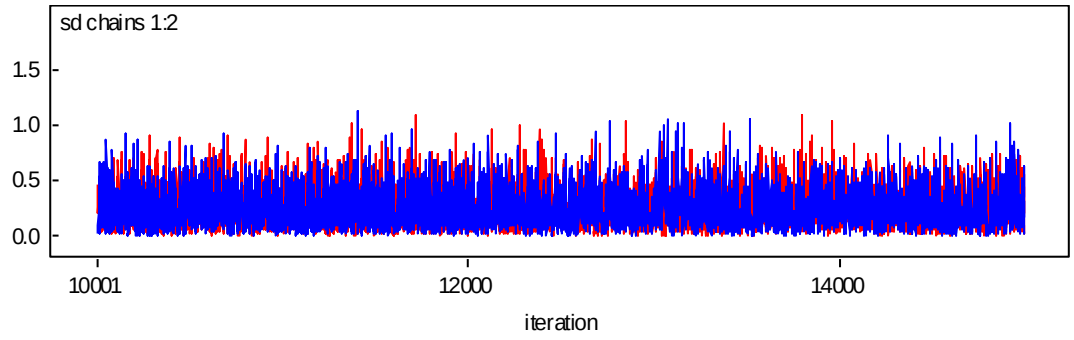
**Figure A32: Convergence, autocorrelation and density plots**




sd chains 1:2 sample: 10000
3.0
2.0
1.0
0.0
-0.5
0.0
0.5
1.0


d[2] chains 1:2
2.0
0.0
-2.0
-4.0
10001
12000
14000
iteration


d[3] chains 1:2
6.0
4.0
2.0
0.0
-2.0
-4.0
10001
12000
14000
iteration


sd chains 1:2
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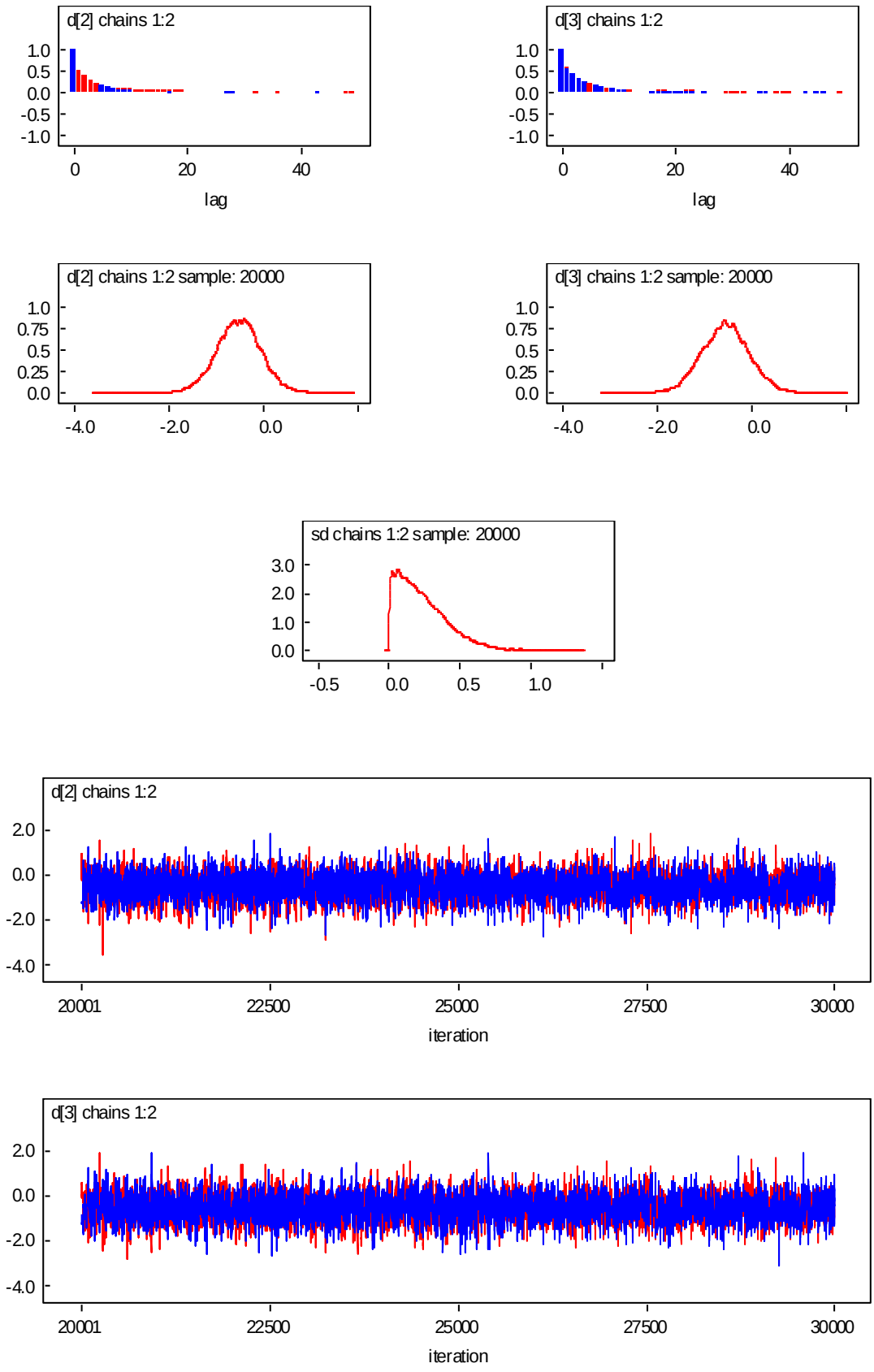
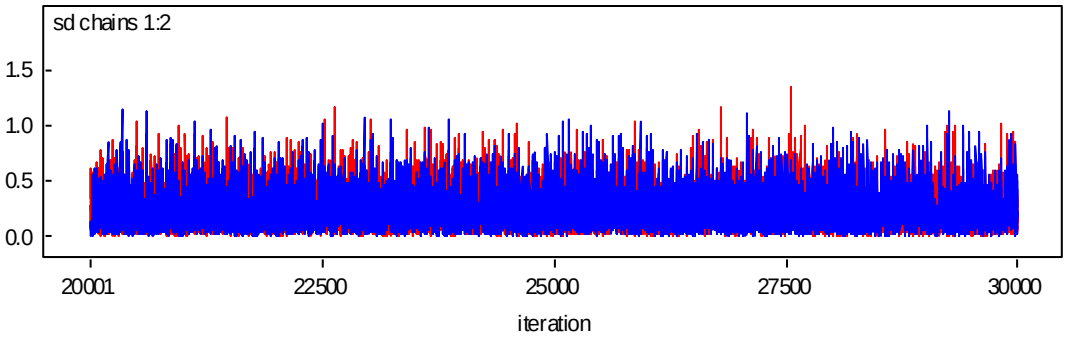
0.5
0.0
10001
12000
14000
iteration

### 6.5.3 Response

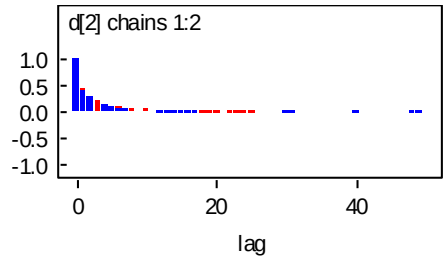
**Figure A33: Convergence, autocorrelation and density plots**

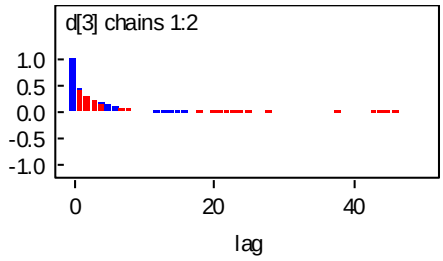


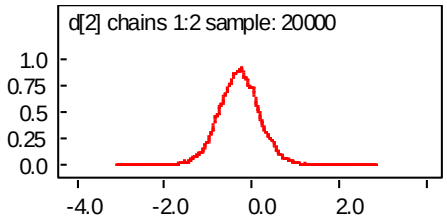


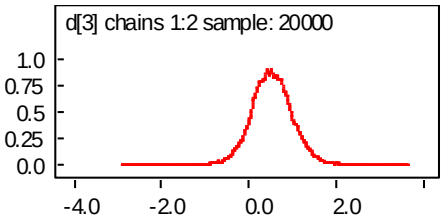

### 6.5.4 High Response

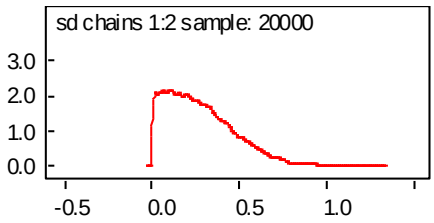
**Figure A34: Convergence, autocorrelation and density plots**

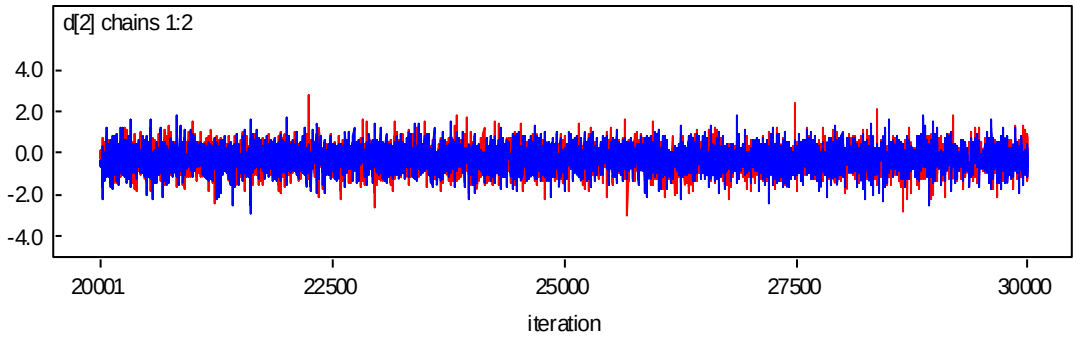
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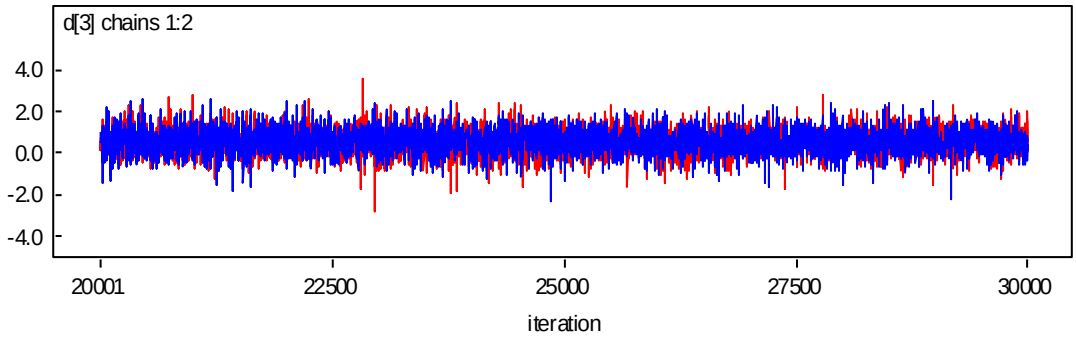
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration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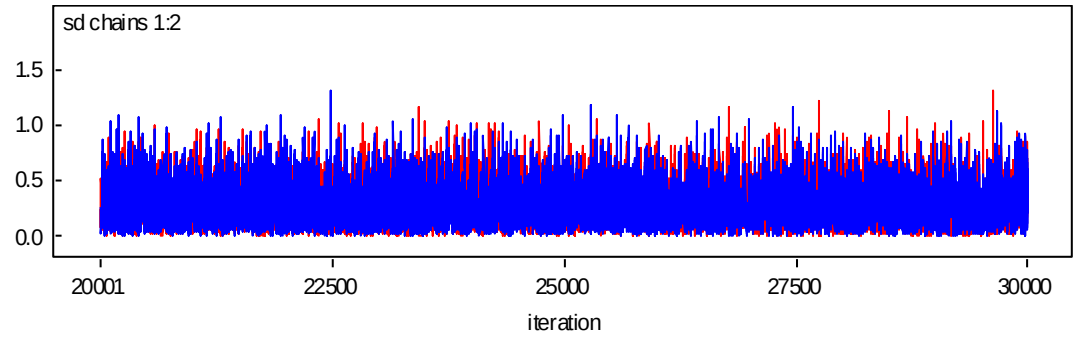
2.0
0.0
-2.0
-4.0
20001
22500
25000
27500
30000
iteration


sd chains 1:2
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1.0
0.5
0.0
20001
22500
25000
27500
30000
iteration

# Adalimumab for treating moderate to severe hidradenitis suppurativa: A Single Technology Appraisal.

## Addendum: ERG critique of company's ACD response


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18/03/2016


**Source of funding**: This report was commissioned by the NIHR HTA Programme as project number 15/06/09.

## 1. Introduction

In February 2016, the National Institute for Health and Care Excellence (NICE) published an Appraisal Consultation Document (ACD) for adalimumab for the treatment of moderate to severe hidradenitis suppurativa.[1] The ACD recommendations are shown in Box 1.

**Box 1: ACD recommendations - adalimumab for moderate to severe hidradenitis suppurativa**

*"1.1 The committee is minded not to recommend adalimumab within its marketing authorisation for treating moderate to severe hidradenitis suppurativa in people whose disease has not responded to conventional therapy.*

*1.2 The committee recommends that NICE requests further analyses from the company, as described in 1.3–1.6. This information should be made available for the second appraisal committee meeting.*

*1.3 The information should include a formal meta-analysis of the PIONEER I and II trials. Either meta-analyses of individual patient data or, if this is not feasible, full justification and a formal meta-analysis based on aggregate data. The analysis should include:*

- *the primary and secondary outcomes common to the trials*
- *outcomes used in the cost-effectiveness analysis*
- *subgroup analyses based on the resulting pooled data.*

*1.4 A revised base-case deterministic and probabilistic cost-effectiveness analysis of adalimumab compared with supportive care should be provided, incorporating:*

- *the results of a formal meta-analysis of the PIONEER trials*
- *the committee's preferred assumption about treatment continuation for people in the non-response health state at 36 weeks or later (see section 4.8).*

*1.5 Three alternative scenario analyses, applied to the revised base case, should also be provided, in which:*

- *Partial response is defined as 25% to 50% reduction in the total abscess and inflammatory nodule (AN) count and no increase in abscesses and draining fistulas.*
- *Transition probabilities beyond week 36 are based on the PIONEER trials instead of the open-label extension study, and missing data are handled consistently.*
- *Both assumptions above are combined."* (NICE ACD,[1] pages 3-4 )

In addition, Section 1.6 of the ACD notes that Appraisal Committee requested further clarification on the measurement of utility values, the company's resource use survey, the use of the M12-555 open-label extension (OLE) study and methods used to validate the company's model.

In response to the ACD,[1] the company submitted four documents and two amended versions of their health economic model:

(i) Company's response to the ACD[2]
(ii) Response to the request for further analyses in the ACD[3]
(iii) Statistical outputs of ordered categorical network meta-analysis (NMA) - base case analysis[4]
(iv) Statistical outputs of ordered categorical NMA - partial responders scenario analysis[5]
(v) Base case model including fixed effects NMAs, the Committee's preferred discontinuation rule, the adalimumab PAS and the ERG's corrections
(vi) Base case model including random effects NMAs, the Committee's preferred discontinuation rule, the adalimumab PAS and the ERG's corrections.

This addendum presents a summary and critique of the company's response to the ACD and the additional analyses requested by the Committee.[2;3] In addition, further exploratory analyses are presented to explore existing uncertainties relating to the costs of inpatient surgical admissions for patients with hidradenitis suppurativa and the long-term transition probabilities used in the company's model.

## 2. Summary of additional evidence presented by the company

### *2.1 Further analyses of clinical evidence presented in the company's ACD response*

The company's "new analyses" document[3] presents three sets of meta-analyses of outcomes from the PIONEER I/II trials:

- Meta-analyses of the primary and secondary outcomes from the PIONEER I/II trials
- Meta-analyses of ordered categorical outcomes used in the cost-effectiveness analysis
- Meta-analyses of subgroups from the PIONEER I and II trials

The methods and results of these analyses are briefly summarised below.

#### *2.1.1 Meta-analyses of the primary and secondary outcomes from the PIONEER I/II trials*

The company undertook meta-analyses of the individual patient data (IPD) and aggregate data from the PIONEER I and II trials. Fixed effects models and random effects models were presented. According to the company's new analyses document,[3] the IPD meta-analysis was based on a one-stage-logistic-model using the maximum likelihood by Laplace approximation method in R. The aggregate data meta-analysis used a binomial likelihood logit link model in WinBUGS for binary response and a normal likelihood identity link model in WinBUGS for continuous outcomes.[3] The WinBUGS code was taken from examples given the NICE Decision Support Unit (DSU) Technical Support Document (TSD) 2.[6] The results of these analyses are summarised in Table 1.

**Table 1: Meta-analyses of primary and secondary outcomes from the PIONEER I/II trials**

| Outcome | Fixed effects Mean (95% CI/CrI) | Random effects Mean (95% CI/CrI) |
|---|---|---|
| HiSCR response (NRI) at week 12 (ITT), OR, models based on IPD by R | 2.888 (2.066 to 4.062; $p$<0.0001) | 2.888 (2.066 to 4.062; $p$<0.0001) |
| HiSCR response (NRI) at week 12 (ITT), OR, Bayesian models based on aggregate data | 2.927 (2.085 to 4.133) | 3.235 (1.761 to 6.952) |
| AN response (achieved AN count of 0,1,2, NRI) at week 12, patients with Hurley stage II at baseline, OR, Bayesian models based on aggregate data | 1.579 (1.002 to 2.499) | 1.619 (0.214 to 13.105) |
| NRS30 response (achieved at least 30% reduction and at least 1 unit reduction from baseline in Patient's Global Assessment of Skin Pain at worst, NRI) at week 12 among patients with baseline NRS>=3 , OR, Bayesian models based on aggregate data | 2.014 (1.315 to 3.093) | 2.145 (0.826,5.888) |
| Change in MSS from baseline to week12 (LOCF) for ITT population, difference between arms, Bayesian models based on aggregate data | -14.950 (-21.920 to -8.028) | -15.160 (-22.47 to -7.574) |
| Change in DLQI from baseline to week12 (LOCF) for ITT population, difference between arms, Bayesian models based on aggregate data | -2.502 (-3.520 to -1.492) | -2.559 (-4.246 to -0.960) |

*HiSCR – Hidradenitis Suppurativa Clinical Response; NRI – non-responder imputation; IPD – individual patient-level data; ITT – intention-to-treat; AN - abscess and inflammatory nodule; MSS – Modified Sartorius Scale; NRS30 - Patient's Global Assessment of Skin Pain; LOCF – last observation carried forward; DLQI – Dermatology Quality of Life Index; OR – odds ratio; CrI – credible interval*

The primary outcome within the PIONEER I/II trials was clinical response as assessed by the Hidradenitis Suppurativa Clinical Response (HiSCR) measure, defined as at least a 50% reduction in the total abscess and inflammatory nodule (AN) count with no increase in abscess count and no increase in draining fistula count relative to baseline. The company's meta-analysis of PIONEER I and II indicates that the odds of patients achieving HiSCR at week 12 is approximately three times greater for adalimumab compared with placebo, based on the IPD (random effects model: OR=2.888; 95% CI, 2.066 to 4.062; $p$<0.0001; fixed effects model: OR=2.888; 95% CI, 2.066 to 4.062; $p$<0.0001) and aggregate patient data (random effects model: OR=3.235; 95% CrI, 1.761 to 6.952; fixed effects model: OR=2.927; 95% CrI, 2.085 to 4.133).

Meta-analyses were also conducted on 12-week data from PIONEER I/II for the secondary outcomes of AN count, Patient's Global Assessment of Skin Pain (NRS30), Modified Sartorius Score (MSS) and the Dermatology Quality of Life Index (DLQI). All secondary analyses were based on aggregate data.

The meta-analysis indicates that the odds of Hurley Stage II patients achieving an AN count of 0, 1, or 2 at week 12 is approximately 1.6 times greater for adalimumab compared with placebo (random

effects model: OR=1.619; 95% CrI, 0.214 to 13.105; fixed effects model: OR=1.579; 95% CrI, 1.002 to 2.499). It is unclear why Hurley Stage III patients have been excluded from this analysis.
The meta-analysis indicates that the odds of patients with a baseline of NRS≥3, achieving at least a 30% reduction, and at least 1 unit reduction from baseline in NRS30 at week 12, is approximately twice that for adalimumab compared with placebo (random effects model: OR=2.145; 95% CrI, 0.826 to 5.888; fixed effects model: OR=2.014; 95% CrI, 1.315 to 3.093).

The meta-analysis indicates that the mean difference between treatment groups to week 12 in MSS is around -15 for adalimumab compared with placebo (random effects model: difference=-15.160; 95% CrI, -22.47 to -7.574; fixed effects model: difference=-14.950; 95% CrI, -21.920 to -8.028).

The meta-analysis for the mean difference between treatment groups in DLQI is around -2.5 for adalimumab compared with placebo (random effects model: difference=2.559; 95% CrI, -4.246 to -0.960; fixed effects model: difference=-2.502; 95% CrI, -3.520 to -1.492). The ERG notes that missing data for MSS and DLQI were imputed using a last observation carried forward (LOCF) approach.

*2.1.2 Meta-analyses of outcomes used in the cost-effectiveness analysis*

The company undertook a series of ordered categorical NMAs using data from the PIONEER I/II trials. Given the multinomial nature of the outcome, treatment effects were measured on the probit scale. The NMAs for relative effects were combined with a baseline model to generate transition matrices for use in the health economic model. The WinBUGS code was taken from NICE DSU TSD 2 Example 6.[6] Both fixed and random effects models were fitted. In addition, separate models were generated using the original definitions of health states and using the Committee's amended definition of partial response and non-response (see Box 1). Transitions occurring between weeks 12 to 36 within the PIONEER I/II data were treated as a single 24-week matrix (rather than 4-weekly matrices derived from the original arm-based summary data). Vague non-informative normal priors with a mean of 0 and a variance of 1000 were given to the study effects (mu) and treatment effects (d). The z.aux node was assigned a uniform prior between 0 and 5. The between-study standard deviation in the random effects model was given a half-normal prior with a mean of 0 and a variance of 0.32. For each of the four sets of analyses (fixed/random effects, original/new definitions of partial response), 20,000 iterations were run as a burn-in period to achieve convergence and then discarded. Results are based on a further 10,000 iterations across 2 chains, using a thinning interval of 10. CODA samples for 20,000 iterations were retained and utilised directly in the company's health economic model. The outputs of these NMAs are not presented within this addendum, but are available from the company's statistical output documents.[4;5]

*2.1.3 Meta-analyses of subgroups from the PIONEER I/II trials*

The company also undertook meta-analyses of subgroup data using the same methods applied to the aggregate data for the analysis of the primary endpoint (using WinBUGS). The company's new analyses document[3] states that the analysis of HiSCR at week 12 was performed only for those subgroups where the sample size allowed the analysis to be performed. The results of these meta-analyses are presented in Table 2. The subgroup analyses were undertaken using a random effects model only.

**Table 2: Meta-analyses of subgroups from the PIONEER I/II trials**

| **Outcome** | **Fixed effects OR Mean (95% CrI)** | **Random effects OR Mean (95% CrI)** |
|---|---|---|
| **HiSCR response (NRI) at week 12 (ITT population) by Baseline AN counts** | | |
| Baseline AN<Median(9) | NR | 2.971 (0.929 to 13.654) |
| Baseline AN>= Median(9) | NR | 5.344 (1.297 to 28.446) |
| **HiSCR response (NRI) at week12 (ITT population) by age** | | |
| Age < 40 | NR | 3.264 (1.132 to 11.917) |
| Age ≥ 40 | NR | 4.754 (1.910 to 15.674) |
| **HiSCR response (NRI) at week12 (ITT population) by gender** | | |
| Female | NR | 3.297 (1.318 to 11.658) |
| Male | NR | 4.323 (1.589 to 14.954) |
| **HiSCR response (NRI) at week12 (ITT population) by race** | | |
| white | NR | 2.980 (1.711 to 5.709) |
| non-white | NR | NR |
| **HiSCR response (NRI) at week12 (ITT population) by HS duration** | | |
| HS duration < Median (9.18 years) | NR | 2.983 (0.937 to 12.756) |
| HS duration ≥ Median (9.18 years) | NR | 4.116 (2.121 to 8.365) |
| **HiSCR response (NRI) at week12 (ITT population) by weight** | | |
| Weight < Median (93 kg) | NR | 3.146 (1.091 to 11.473) |
| Weight >= Median (93 kg) | NR | 3.717 (1.685 to 9.403) |
| **HiSCR response (NRI) at week12 (ITT population) by BMI** | | |
| BMI < Median (32.06) | NR | 2.729 (1.242 to 6.801) |
| BMI >= Median (32.06) | NR | 4.482 (1.527 to 23.196) |
| **HiSCR response (NRI) at week12 (ITT population) by smoking status** | | |
| Not current smoker | NR | 4.674 (1.758 to 18.653) |
| Current smoker | NR | 3.228 (1.266 to 12.579) |
| **HiSCR response (NRI) at week12 (ITT population) by prior HS surgery status** | | |
| Prior HS surgery=No | NR | 3.408 (1.687 to 8.207) |
| Prior HS surgery=Yes | NR | NR |

*HiSCR – Hidradenitis Suppurativa Clinical Response; NRI – non-responder imputation; ITT – intention-to-treat; HS – hidradenitis suppurativa; kg – kilogram; AN - abscess and inflammatory nodule; BMI – body mass index; OR – odds ratio; CrI – credible interval; NR – not reported*

The meta-analyses of subgroups from PIONEER I/II indicate that the odds of patients achieving HiSCR at week 12 is higher for those patients with a median baseline AN count of ≥9 (5.344 compared with 2.971 for patients with a median baseline AN count of <9); for patients aged 40 years or more (4.754 compared with 3.264 for patients aged <40 years); for men (4.323 compared with 3.297 for women); for patients with a median duration of disease of ≥9.18 years (4.116 compared with

2.983 for patients with a median duration of disease of <9.18 years); for patients with a median weight of ≥93kg at baseline (3.717 compared with 3.146 for patients with a weight of <93kg); for patients with a median body mass index (BMI) >32.06 (4.482 compared with 2.729 for patients with a median baseline BMI <32.06), and; for current non-smokers (4.674 compared with 3.228 for current smokers).

*2.2 Additional information presented in the company's ACD response*

In addition to the meta-analyses detailed in Section 2.1, the company's new analyses document[3] also presents additional information requested by the Committee in Section 1.6 of the ACD[1] relating to: (i) the measurement of EQ-5D health utilities within PIONEER II; (ii) the company's resource use survey; (iii) the methods used to analyse data from the M12-555 OLE study, and; (iv) validation outputs of the company's health economic model. These data are not reproduced within this addendum.

*2.3 Company's alterations to the original health economic model*

The company's new health economic analyses are based on the ERG-corrected version of the company's original submitted model (see ERG report,[9] ERG exploratory analysis 1, page 118 and Appendix 2). Within this exploratory analysis, the ERG corrected inconsistencies in the number of days in a year, resolved the issues surrounding the implementation of the half-cycle correction and altered the timing of the adalimumab acquisition costs to reflect the licensed dosing schedule. In addition, the Patient Access Scheme (PAS) for adalimumab in the hidradenitis suppurativa indication was included (PAS acquisition cost=[redacted], set-up costs=[redacted] per patient, implementation costs=[redacted] per order). The ERG notes that all of the company's new health economic analyses retain the company's original estimate of the cost of an inpatient surgical stay of £5,488.32 per episode; this is discussed in further detail in Section 3.4.3.

In order to apply the transition probabilities generated using the ordered categorical NMAs (see Section 2.1.2), the company made the following amendments to the model:

- Additional worksheets containing CODA samples from the fixed effects and random effects NMAs were included in the model.
- Transition probabilities for weeks 0-2, weeks 2-4, weeks 4-8 and weeks 8-12 for adalimumab and standard care were replaced with those generated using the NMAs.
- The duration of cycle 5 was increased to 24-weeks. An additional matrix detailing transition probabilities for the period 12-36 weeks for each treatment group was generated using the NMAs. These 24-week matrices were used in place of the 6 separate 4-week matrices applied within the company's original model (during cycle 5 only).

- The costs and QALY gains for each option during cycle 5 were multiplied by 6 to reflect this longer transition interval (new 24-week matrix equal to six 4-week cycles).
- Column totals were amended to reflect the lower number of cycles in the amended model.
- The deterministic analyses look up the median transition probability for each parameter.
- The probabilistic analyses look up rows of sampled transition probabilities from the CODA output based on a random number for each matrix row (an approach similar to simple bootstrapping).

In addition, the probability of discontinuation from adalimumab for non-responders from week 36 onwards was set equal to 1.00; this reflects the Committee's preferred discontinuation rule for adalimumab secondary non-responders outlined in the ACD.[1]

The company's sensitivity analyses include the following additional amendments to the model:

- Separate NMA-derived transition matrices are included taking into account the re-definition of partial response.
- New transition matrices for weeks 36+ (based generalised logit models [GLMs]) are included taking into account the re-definition of partial response.

New health economic results are presented for the following scenarios:

- Base case analysis NMA (fixed/random effects, deterministic/probabilistic)
- Re-definition of partial responders (fixed/random effects)
- Week 36+ transitions based on PIONEER I/II trials (fixed/random effects)
- Re-definition of partial responders and week 36+ transitions based on PIONEER trials (fixed/random effects).

*2.4 Results of company's new health economic analyses*

This section summarises the results of the new health economic analyses presented in the company's ACD response.[2;3] It should be noted that the models submitted as part of the company's original ACD response included two sets of errors which rendered the results unreliable (see Section 3.4.1). Following a request from the ERG to investigate and resolve these issues, the company submitted new models and documentation which rectified these errors. All health economic results presented in this addendum therefore include these corrections.

*2.4.1 Company's new base case results*

Table 3 presents the company's revised base case results based on the random effects NMA. The analyses presented in Table 3 include the correction of programming errors identified by the ERG, the

Committee's preferred discontinuation rule and the PAS for adalimumab in the hidradenitis suppurativa indication.

**Table 3: Company's cost-effectiveness results - random effects NMA, including Committee's preferred discontinuation rule, PAS and ERG corrections**

| **Probabilistic analysis** | | | | | |
|---|---|---|---|---|---|
| **Option** | **QALYs** | **Costs** | **Incremental QALYs** | **Incremental costs** | **Incremental cost per QALY gained** |
| Adalimumab | 12.61 | £142,407 | 0.98 | £13,345 | **£13,676** |
| Standard care | 11.64 | £129,062 | - | - | - |
| **Deterministic analysis** | | | | | |
| **Option** | **QALYs** | **Costs** | **Incremental QALYs** | **Incremental costs** | **Incremental cost per QALY gained** |
| Adalimumab | 12.58 | £140,342 | 0.95 | £11,695 | **£12,336** |
| Standard care | 11.63 | £128,647 | - | - | - |

*QALY – quality-adjusted life year*

Based on the random effects NMA, the probabilistic version of the company's model suggests that adalimumab produces an additional 0.98 QALYs at an additional cost of £13,345 compared with standard care; the incremental cost-effectiveness ratio (ICER) for adalimumab versus standard care is expected to be £13,676 per QALY gained. The ICER produced from the deterministic analysis of the model is slightly lower (ICER=£12,336 per QALY gained).

Table 4 presents the company's revised base case results based on the fixed effects NMA. The analyses presented in Table 4 include the correction of programming errors identified by the ERG, the Committee's preferred discontinuation rule and the PAS for adalimumab in the hidradenitis suppurativa indication.

**Table 4: Company's cost-effectiveness results – fixed effects NMA, including Committee's preferred discontinuation rule, PAS and ERG corrections**

| **Probabilistic analysis** | | | | | |
|---|---|---|---|---|---|
| **Option** | **QALYs** | **Costs** | **Incremental QALYs** | **Incremental costs** | **Incremental cost per QALY gained** |
| Adalimumab | 12.60 | £141,109 | 0.96 | £12,712 | **£13,183** |
| Standard care | 11.64 | £128,396 | - | - | - |
| **Deterministic analysis** | | | | | |
| **Option** | **QALYs** | **Costs** | **Incremental QALYs** | **Incremental costs** | **Incremental cost per QALY gained** |
| Adalimumab | 12.58 | £140,349 | 0.95 | £11,701 | **£12,338** |
| Standard care | 11.63 | £128,648 | - | - | - |

*QALY – quality-adjusted life year*

Based on the fixed effects NMA, the probabilistic version of the company's model suggests that adalimumab produces and additional 0.96 QALYs at an additional cost of £12,712 compared with standard care; the ICER for adalimumab versus standard care is expected to be £13,183 per QALY gained. The ICER produced from the deterministic analysis of the model is slightly lower (ICER=£12,338 per QALY gained).

*2.4.2 Company's new sensitivity analysis results*

Table 5 summarises the results of the additional sensitivity analyses presented by the company.[3] All sensitivity analysis results are based on the deterministic version of the company's model and include the correction of programming errors identified by the ERG, the Committee's preferred discontinuation rule and the PAS for adalimumab in the hidradenitis suppurativa indication.

**Table 5: Summary of sensitivity analyses presented in company's ACD response and additional analyses document**

| Scenario | ICER adalimumab versus standard care (random effects) | ICER adalimumab versus standard care (fixed effects) |
|---|---|---|
| Base case | £12,336 | £12,338 |
| New definition of partial response | £7,646 | £7,656 |
| Week 36+ transitions based on PIONEER I/II | £2,098 | £2,101 |
| New definition of partial response and week 36+ transitions based on PIONEER I/II | £2,002 | £2,014 |

*ICER – incremental cost-effectiveness ratio*

The company's sensitivity analyses indicate that the re-definition of partial response reduces the ICER for adalimumab versus standard care to around £7,650 per QALY gained. The analyses in which the week 36+ transition matrices for adalimumab responders are based on the GLMs fitted to data from the PIONEER I/II trials reduce the ICER further to around £2,100 per QALY gained. When these two scenarios are combined, the ICER for adalimumab versus standard care is estimated to be approximately £2,000 per QALY gained. It should be noted that the ERG has several concerns regarding the robustness of these sensitivity analyses (see Section 3.4.2).

## 3. ERG critique of the further analyses presented in the company's response to ACD2

*3.1 Critical appraisal and model verification/validation methods*

In order to critique the additional analyses presented by the company in response to the ACD, the ERG adopted the following approaches:

- Scrutiny of all documentation submitted by the company.
- Comparison of transition probabilities derived from simple arm-based summary data from PIONEER I/II and from the company's NMAs.

- Checking of cells linking the NMAs outputs to the transition matrices in the company's model.
- Scrutiny of amendments to allow for the incorporation of the NMAs within the model.
- Reproduction of the company's new ICERs using the NMA-derived transition matrices within the original ERG-corrected version of the model.

*3.2 ERG critique of company's NMA methods*

With respect to the meta-analyses presented within the company's ACD response,[3] the ERG is broadly satisfied that the methods outlined in NICE TSD 2[6] have been followed. However, the ERG makes the following observations:

- The proportion of patients with "no response" on the reference treatment is given a prior distribution on the probit scale; there is no discussion in the text describing the basis for this distribution.
- The total residual deviance is given in the tables in the statistical outputs documents;[4;5] however, the number of data points upon which this is based is not mentioned in the text. Consequently, it is not possible to assess the absolute goodness-of-fit of the models.
- The further analyses document[3] includes the results of Bayesian random effects models. The results suggest that a reference prior distribution for the between-study standard deviation was used when there were insufficient studies to allow Bayesian updating.
    - Results of the analysis of binary outcomes summarised as odds ratios may not be realistic where the upper limit of the 95% credible interval exceeds 1.0.
    - No details are given of the prior distribution specified for the between-study standard deviation for continuous outcomes. Results of the analyses of continuous outcomes may not be plausible if the prior distribution for the between-study standard deviation was not appropriate for the scale of the outcome.
- Rather than performing separate subgroup analyses (which were presumably undertaken to explore the consistency of treatment effects across subgroups), the ERG considers that it would have been more appropriate to fit models including interaction terms and to assess the significance of the interaction terms.
- Strictly speaking, the probabilistic analysis should incorporate uncertainty based on predictive distributions rather than means of random effects distributions. It is unclear whether the CODA samples are based on the posterior distribution or the predictive distribution.
- The company's NMAs were conducted for both fixed and random effects models. In general, we expect variation in treatment effects between studies as a consequence of differences in study conduct and patient characteristics. A fixed effects model can be used if we are interested in making inferences conditional on the studies available for analysis. However, if we want to make an unconditional inference allowing for potential heterogeneity then a random effects

model is appropriate. Defaulting to a fixed effect model because there are insufficient studies to estimate the between-study standard deviation may underestimate heterogeneity. The ERG prefers the use of a random effects model that acknowledges the potential for heterogeneity, including external information if necessary about the plausible magnitude of the between-study standard deviation.

*3.3 ERG comments on additional information submitted by the company*

With respect to the additional information provided by the company in response to the Committee's clarification requests, the ERG makes the following observations:

- *EQ-5D estimates from PIONEER II.* The company's additional analyses include information concerning the collection of EQ-5D data within the PIONEER II trial (see company's new analyses document,[3] Table 26). The ERG notes the very high level of attrition in the week 36 data. Whilst 100 patients in the non-response category completed the EQ-5D questionnaire at week 12, only 7 patients with non-response contributed data to the week 36 assessment. Given the imbalance in the proportion of patients in each category contributing data at week 36, it is possible that outcomes are subject to informative censoring. This may produce some bias in the utility values applied in the health economic model, although the magnitude of this potential bias is unclear.
- *Company's resource use survey.* The company's additional information is largely the same as that contained within the original company submission (CS),[7] their response to clarification questions[8] and their original health economic model.
- *M12-555 OLE study.* As discussed in the ERG report,[9] the GLM fitted to the M12-555 OLE data used in the model has been derived from an interim analysis. Given the immaturity of these data, particularly in terms of length of follow-up for the overall OLE cohort, these transition probabilities are subject to considerable uncertainty. In addition, the use of an unblinded observational design may introduce the risk of bias and confounding.
- *Model validation – Markov trace*. The new analyses document[3] includes vectors displaying the percentage of patients in each of the four living health states for the adalimumab and standard care groups (see new analyses document,[3] Tables 30 and 31). The document states that the values for the adalimumab group are the same as those presented in the CS (see CS,[7] Table 58). The ERG was unable to replicate the predicted percentages of patients included in either group at weeks 12 or 36. The ERG also notes that given that the model has been amended to include NMA-derived transition probabilities, it is unclear why neither the "observed" nor the "predicted" values have changed compared with those given in the original CS.[7] It is also unclear whether the "predicted" columns reflect the use of fixed or random effects NMAs (or neither). In addition, the ERG notes that whilst Table 30 of the company's new analyses document[3] suggests that the predicted and observed percentage of adalimumab non-responders at week 12 is 0.0%, this does not reflect the findings of either the PIONEER I/II trials or the company's Markov trace. As such, the ERG does not consider the company's model validation exercise to be reliable.
- *Model validation – mean utility prediction at weeks 12 and 36.* Given the limited number of patients contributing EQ-5D data at week 36 in PIONEER II, the company's comparison of

mean observed utility and model-predicted utility at 36 weeks may not be meaningful. The model based only on data from the PIONEER II trial predicts a 12-week incremental QALY gain of 0.02 for adalimumab versus standard care. The PIONEER II study reported a mean change from baseline in EQ-5D at week 12 for adalimumab versus placebo to be 0.1 ($p$<0.001).[7] Assuming that the observed gain in health utility is maintained over the entire 12-week period, this would suggest an incremental QALY gain of approximately 0.02. This suggests that at least during the induction phase, the company's model produces predicted incremental QALY gains which are consistent with those observed within PIONEER II.

*3.4 ERG critique of company's new health economic analyses*

*3.4.1 Verification of the company's implementation of the NMAs within the health economic model*

During the process of verifying the company's new analyses, the ERG identified two sets of unequivocal errors. These errors related to: (i) the incorrect calculation of drug acquisition costs in the adalimumab group during cycle 5 (weeks 12-36), and; (ii) the incorrect linking of all NMA-derived transition probabilities to the active transition matrices in the model.

*(i) Miscalculation of adalimumab acquisition costs*

Within the company's new model, the formulae used to calculate total drug acquisition costs for the adalimumab group during the week 12-36 cycle (sheet "Markov Trace – ADA" cells BE:BH15) were incorrect. Specifically, the formulae were missing a necessary set of brackets; this meant that only the acquisition costs of adalimumab for patients in the partial response state were uplifted by the increased duration of the cycle (24 weeks), whilst costs applied to the other states assumed a 4-week cycle. This error did not apply to the standard care group. Consequently, the company's new analyses miscalculated the total costs of adalimumab and the ICERs for adalimumab versus standard care in the company's ACD response[3] were underestimated.

*(ii) Incorrect linking of transition probabilities from the NMA in the model*

The ERG compared the NMA-derived transition probabilities applied in the company's new model against the arm-based summary matrices used in the original model. The ERG noted that the transition probabilities were very different. In particular, the values were linked in such a way that the "destination state" ordering within each matrix appeared to have been inverted. In other words, this resulted in the following problems:

- Where the formulae should have looked up the probability of transiting to high response (state 1), they were instead looking up the probability of transiting to no response (state 4).
- Where the formulae should have looked up the probability of transiting to response (state 2), they were instead looking up the probability of transiting to partial response (state 3).

- Where the formulae should have looked up the probability of transiting to partial response (state 3), they were instead looking up the probability of transiting to response (state 2).
- Where the formulae should have looked up the probability of transiting to no response (state 4), they were instead looking up the probability of transiting to high response (state 1).

This error applied to all of the company's NMA-derived matrices in the new model and thus led to very different Markov traces compared with the original model. Consequently, the new health economic analyses presented in the company's original ACD response[3] could not be considered reliable. In response to a request from the ERG for the company to investigate this matter, the company confirmed that the ordering of the transition probabilities within all NMA-derived matrices had been erroneously inverted. The company subsequently revised all of their analyses to address these two problems. All ICERs presented in this addendum therefore include these corrections.

During further verification by the ERG, a third error was identified. During weeks 12-36, the 24-week matrix applies the original 4-week discontinuation probability (1.75%). By translating between probabilities and rates, converting this 4-week probability to a 24-week probability gives a corrected figure of 10.04%. This corrected value is used in all ERG exploratory analyses (see Section 4).

Based on the model amendments described in the company's further analyses document[3] and the NMA-derived transition matrices included in the company's new model, the ERG was able to use the ERG-corrected model (ERG exploratory analysis 1, see ERG report,[9] page 118 and Appendix 2) to produce the deterministic ICERs presented in the company's ACD response (excluding the error relating to the discontinuation rate during cycle 5). The ERG was also able to use the company's new model to replicate the company's sensitivity analysis results. A re-run of the probabilistic sensitivity analysis by the ERG produced similar results to those contained in the company's new analyses document.[3] The company's base case ICERs however remain unreliable for three reasons:

(1) The discontinuation rate applied in cycle 5 is incorrect.
(2) The mean cost of surgical inpatient admissions is clinically unrealistic.
(3) The NMA-derived transition matrices apply only to the first 36 weeks of the model; beyond this timepoint, the new model uses the same arm-based summary data applied in the original analysis, thereby breaking randomisation. Given that the company's base case uses GLM fitted to the M12-555 OLE study for adalimumab responders and a GLM fitted to the PIONEER II placebo patients for the standard care group, this issue only applies to those patients who discontinue adalimumab. The ERG also notes that the adalimumab discontinuation group is not a randomised group and according to the company's GLMs, this group has a better long-term prognosis than patients who never received adalimumab. The clinical plausibility of this difference in prognosis is unclear.

These issues are addressed in the ERG's exploratory analyses (see Section 4).

*3.4.2 Issues relating to the company's sensitivity analyses*

Despite the correction of the base case analyses, the ERG has concerns regarding the robustness of the company's sensitivity analyses:

1. *The impact of redefining partial response and non-response on other model parameters has not been fully accounted for.* Whilst the company has undertaken separate NMAs based on the re-definition of partial responders, the sensitivity analysis undertaken using the company's new model is restricted only to altering the transition probabilities. However, the values of other model parameters will also be affected by this alternative definition, for example, the health utility values and the adalimumab discontinuation rates. The health state costs associated with partial response and no response would also likely be affected, although it is unclear whether the available survey data would have allowed for an appropriate re-analysis.
2. *The week 36+ transition matrices derived from the GLMs of PIONEER I/II data are not based on a formal meta-analysis.* The company's revised model includes the same week 36+ transition matrices as that used in the original CS.[7] These were derived through the use of simple arm-based summary data, thereby breaking randomisation. The ERG's concerns regarding the differential prognosis of adalimumab discontinuers and patients receiving standard care also apply to this analysis.

As a consequence of these inconsistencies, the ERG does not consider the company's sensitivity analyses to be reliable.

*3.4.3 Uncertainty surrounding the costs of surgery*

As noted in Section 2.3, the company's new analyses retain the company's original estimate of the cost of an inpatient surgical stay. The ERG report[9] highlighted concerns regarding the estimated lifetime costs associated with inpatient admissions predicted by the company's model. Based on the company's new model (using transition probabilities derived from the random effects NMA), within the standard care group, the model predicts that the average patient will require approximately 33.90 inpatient surgical admissions over their remaining lifetime. The equivalent number in the adalimumab group is approximately 29.96 admissions. The tariff cost applied to each inpatient admission is £5,488.32 and is associated with a length of stay of 5.1 days; this might be considered to be broadly reflective of a wide excision procedure. The ERG notes that whilst the model predicts that adalimumab reduces surgery costs, the company has not provided any evidence to demonstrate a reduction in overall surgical admissions for adalimumab relative to standard care.

Within the ACD,[1] the Committee noted uncertainty around the true lifetime cost of surgery:

*"The clinical experts agreed that the company had overestimated the surgery-related resource use, and stated that most surgeries are minor procedures; wide excisions are less common. The clinical experts suggested that the ERG's alternative assumptions about surgical procedures may have underestimated the costs, but could not present any alternative estimates. The clinical experts also disagreed with the company's assumption that adalimumab reduced the number of inpatient admissions compared with supportive care; stating that there is no clinical evidence to support this. The committee was unclear whether adalimumab would reduce the need for surgery. The committee concluded that the company had overestimated resource use costs for supportive care and adalimumab, and that the true values were closer to the ERG's estimates."* (NICE ACD,[1] Section 4.13, pages 27-28)

The company's ACD response[2] argues that the ERG's preferred base case (see ERG report,[9] exploratory analysis 3, page 124) underestimates the cost of surgery for hidradenitis suppurativa. The company's ACD response mentions an AbbVie observational cross-sectional study of 101 patients with hidradenitis suppurativa over a 5-year period prior to July 2014-April 2015. Of these 101 patients, 41% had surgery (86 surgeries over 5 years). Of these, 13.9% (n=12) had surgical complications, and 34.1% (n=14) had recurrent surgery most of which was at the same site (78.6%, n=11). The median time to next surgery was 5 months and the median time to recurrence of disease was 10.2 months (range 0.2 -66 months).[2]

The ERG notes that the company's cross-sectional study suggests that: (a) not all patients will undergo surgery (over a 5-year period) and that (b) on average, patients underwent 0.17 surgeries per year. This is considerably lower than the estimates predicted by the company's model (approximately 0.51 surgeries each year for the patient's remaining lifetime [33.90 inpatient admissions over 66 years]). Further, it is unclear from the company's cross-sectional study how many of these surgical procedures incurred an inpatient stay and how many did not; the ERG notes that the costs of surgery-related outpatient visits and wound care are parameterised separately in the company's model.

The company's ACD response[2] also refers to market research data relating to 315 patients with hidradenitis suppurativa which indicate that 79% of patients required surgery. These data also indicated that local incision and drainage was the most common procedure and that 38% of patients also reported having wide excisions.

The ERG notes that these market research data are not helpful in reducing the uncertainty around the mean cost of inpatient surgical admissions as the time period under consideration is unclear and no information is provided regarding the number of wide excisions received by the patients included in the sample.

The company's ACD response[2] also suggests that the ERG's assumption that 67% of inpatient surgeries (based on HES data) take place in a day case setting was likely to be an overestimate as this estimate relates only to patients who had a first recorded inpatient HS diagnosis code (index spell) during the study period. The company's ACD response states that based on the total number of inpatient spells reported during the 6.5-year study period, 31,875 of 65,544 (48.63%) inpatient admissions took place in a day case setting. The ERG notes that this additional information was mentioned by the company in the first Appraisal Committee meeting but was not reported in the original CS.[7] The ERG is however unclear whether all inpatient spells for the included cohort specifically relate to inpatient surgical procedures for hidradenitis suppurativa or whether other types of surgical procedure for other conditions may have been included in this lower estimate.

The ERG further notes that the company has not provided any additional information regarding the mean cost of inpatient surgical admissions and therefore uncertainty remains regarding the true value of this parameter. This has not been addressed in the company's new analyses. Given that the cost assumed by the company appears to reflect that of a wide excision, the company's analysis implies that over their remaining lifetime, the average patient on standard care will undergo around 33.90 wide excisions whilst the average patient receiving adalimumab will undergo around 29.96 wide excisions. The ERG considers this to be highly implausible and produces a bias in favour of adalimumab.

The ACD response received from the British Association of Dermatology (BAD)[10] states that a higher number of wide excisions may be possible:

*"In particular, it may be that three or four wide excisions are required on average during the lifetime of a patient with moderate to severe HS, rather than the estimate of two wide excisions included in the ERG report."* (Response to the ACD from the British Association of Dermatologists,[7] 2016)

Given this remaining uncertainty, the ERG has conducted further exploratory analyses around the cost of surgical inpatient procedures using the company's revised base case model.

## 4. Additional exploratory analyses undertaken by the ERG

### *4.1 Description of exploratory analyses undertaken by the ERG*

The ERG undertook additional exploratory analyses around the following scenarios using the company's model, based only on the random effects NMA:

- Exploratory analysis 1 – Discontinuation rate corrected
- Exploratory analysis 2 – Discontinuation rate corrected, ERG's original surgery cost estimate

- Exploratory analysis 3 - Discontinuation rate corrected, proportion of inpatient procedures set to 0.49
- Exploratory analysis 4 - Discontinuation rate corrected, proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 3
- Exploratory analysis 5 - Discontinuation rate corrected, proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 4
- Exploratory analysis 6 - Discontinuation rate corrected, difference in inpatient surgical admissions removed from the model (inpatient surgery cost set equal to zero)
- Exploratory analysis 7 - Discontinuation rate corrected, ERG's original surgery cost estimate, adalimumab discontinuation week 36+ GLM set equal to standard care GLM
- Exploratory analysis 8 - Discontinuation rate corrected, proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 4, adalimumab discontinuation week 36+ GLM set equal to standard care GLM
- Exploratory analysis 9 - Discontinuation rate corrected, difference in inpatient surgical admissions removed from the model (inpatient surgery cost set equal to zero), adalimumab discontinuation week 36+ GLM set equal to standard care GLM

All analyses include the correction of programming errors identified by the ERG, the Committee's preferred discontinuation rule and the PAS for adalimumab in the hidradenitis suppurativa indication.

*4.2 Results of exploratory analyses undertaken by the ERG*

The results of these additional exploratory analyses are presented in Tables 6-14. Unless otherwise stated, all analyses are based on the deterministic version of the company's model.

**Table 6: ERG exploratory analysis 1 - Company's surgery cost estimate (mean cost=£5,488.32), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £138,686 | 0.93 | £10,038 | **£10,770** |
| Standard care | 11.63 | £128,647 | - | - | - |

*QALY – quality-adjusted life year*

**Table 7: ERG exploratory analysis 2 - ERG's original surgery cost estimate (mean cost=£1,525.74), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £82,585 | 0.93 | £18,469 | **£19,816** |
| Standard care | 11.63 | £64,116 | - | - | - |

*QALY – quality-adjusted life year*

**Table 8: ERG exploratory analysis 3 - Proportion of inpatient procedures set to 0.49 (mean cost=£1,738.73), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £85,601 | 0.93 | £18,016 | **£19,330** |
| Standard care | 11.63 | £67,585 | - | - | - |

*QALY – quality-adjusted life year*

**Table 9: ERG exploratory analysis 4 - Proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 3 (mean cost=£1,838.69), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £87,016 | 0.93 | £17,804 | **£19,101** |
| Standard care | 11.63 | £69,212 | - | - | - |

*QALY – quality-adjusted life year*

**Table 10: ERG exploratory analysis 5 - Proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 4 (mean cost= £1,938.65), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £88,431 | 0.93 | £17,591 | **£18,873** |
| Standard care | 11.63 | £70,840 | - | - | - |

*QALY – quality-adjusted life year*

**Table 11: ERG exploratory analysis 6 - Difference in inpatient surgery removed from the model (inpatient surgery cost set equal to zero), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule and adalimumab PAS**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.56 | £60,985 | 0.93 | £21,716 | **£23,299** |
| Standard care | 11.63 | £39,269 | - | - | - |

*QALY – quality-adjusted life year*

**Table 12: ERG exploratory analysis 7 - ERG's original surgery cost estimate (mean cost=£1,525.74), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule, adalimumab PAS and adalimumab discontinuation week 36+ GLM set equal to standard care week 36+ GLM**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.35 | £84,076 | 0.72 | £19,960 | **£27,701** |
| Standard care | 11.63 | £64,116 | - | - | - |

*QALY – quality-adjusted life year*

**Table 13: ERG exploratory analysis 8 - Proportion of inpatient procedures set to 0.49 and number of wide excisions over lifetime set to 4 (mean cost= £1,938.65), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule, adalimumab PAS and adalimumab discontinuation week 36+ GLM set equal to standard care week 36+ GLM**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.35 | £90,124 | 0.72 | £19,284 | **£26,763** |
| Standard care | 11.63 | £70,840 | - | - | - |

*QALY – quality-adjusted life year*

**Table 14: ERG exploratory analysis 9 - Difference in inpatient surgery removed from the model (inpatient surgery cost set equal to zero), random effects NMA, ERG corrections, corrected discontinuation rate during cycle 5, Committee's preferred discontinuation rule, adalimumab PAS and adalimumab discontinuation week 36+ GLM set equal to standard care week 36+ GLM**

| Option | QALYs | Costs | Incremental QALYs | Incremental costs | Incremental cost per QALY gained |
|---|---|---|---|---|---|
| Adalimumab | 12.35 | £61,726 | 0.72 | £22,457 | **£31,167** |
| Standard care | 11.63 | £39,269 | - | - | - |

*QALY – quality-adjusted life year*

As shown in Table 6, the correction of the error relating to the adalimumab discontinuation rate during cycle 5 improves the ICER for adalimumab versus standard care compared with the company's base case (ICER=£10,770 per QALY gained). However, the inclusion of a lower mean cost for inpatient surgical admissions increases the ICER considerably; based on the ERG's original estimated cost of surgery (£1,525.74 per episode), the ICER for adalimumab versus standard care is increased to £19,816 per QALY gained. As shown in Tables 8 to 10, altering the proportion of surgeries taking place in a day case setting and the mean number of wide excisions does not materially impact upon the ICER (range from £18,873 to 19,101 per QALY gained) compared with the use of the ERG's original estimate. The probabilistic ICER for the most favourable costing scenario (49% surgeries in the day case setting and 4 wide local excisions) is estimated to be £20,196 per QALY gained (deterministic ICER=£18,873 per QALY gained). Under the least favourable costing scenario (no reduction in inpatient admissions), the probabilistic ICER is estimated to be £24,769 per QALY gained (deterministic ICER=£23,299 per QALY gained).

Tables 12-14 present alternative analyses in which the long-term (week 36+) transition matrix for adalimumab discontinuers is assumed to be the same as that for the standard care group. When combined with the range of alternative costing scenarios, the assumption of no difference in long-term prognosis for adalimumab discontinuers and the standard care group increases the deterministic ICER for adalimumab versus standard care to between £26,763 and £31,167 per QALY gained. The corresponding range of probabilistic ICERs for these scenarios is £28,525 to £33,231 per QALY gained.

**5. Conclusions**

Within their response to the ACD, the company presents the methods and results of meta-analyses of the 12-week data from the PIONEER I/II studies for the primary and secondary endpoints for the ITT population and across subgroups. The ERG considers that overall, the NMAs appear to have been implemented appropriately.

With respect to the health economic model submitted as part of the company's original ACD response, the ERG identified two sets of errors which meant that the company's health economic results could not be considered reliable. The company subsequently corrected these errors and produced new ICERs. Subsequently, the ERG identified a further error relating to the probability of discontinuing adalimumab during cycle 5. The ICERs presented in the company's ACD response are therefore not reliable. With the exception of this latter error, the ERG is however satisfied that the NMAs and adalimumab continuation rule have been applied appropriately in the company's base case analyses. The ERG notes however that the NMA-derived transition matrices have been applied only

for the first 36-weeks of the time horizon; thereafter, the transition matrices used are the same as those in the company's original model. From week 36 onwards, the transition matrices are based on GLMs which directly imply that patients discontinuing adalimumab have a better prognosis than patients who never received the drug. These matrices are applied indefinitely over the remainder of the time horizon. The clinical plausibility of this assumption of sustained benefit is unclear. The ERG also considers the company's estimate of the cost of surgery to be unrealistically high. Further, the ERG considers the interpretation of the company's sensitivity analyses is problematic because: (a) the partial responder analysis is limited to the transition probabilities and does not include different costs or utilities according to this new definition, and; (b) the extrapolation based on the PIONEER I/II data is implemented through the use of arm-based summaries rather than formal meta-analysis.

The ERG's exploratory analyses suggest that correcting the error relating to the probability of discontinuation during cycle 5 improves the ICER for adalimumab versus standard care (ICER=£10,770 per QALY gained). Assuming a lower mean cost of surgery produces probabilistic ICERs for adalimumab versus standard care in the range of £20,196 per QALY gained to £24,769 per QALY gained. When combined with these alternative costing scenarios, the inclusion of an assumption whereby the long-term transition matrix for adalimumab discontinuers is the same as that for standard care patients produces probabilistic ICERs for adalimumab versus standard care in the range of £28,525 to £33,231 per QALY gained.

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