



HealthConnect

A HEALTH INFORMATION NETWORK FOR ALL AUSTRALIANS

**PUBLIC CONSULTATION ON DEVELOPMENT
OF SYSTEMS ARCHITECTURE**

REPORT ON ANALYSIS OF RESPONSES

Version 2.0

28 April 2004

DH4 Pty Ltd for Design Section,
National eHealth Systems Branch
Information and Communications Division
Department of Health and Ageing

CONTENTS

1. SUMMARY	1
1.1 Introduction	1
1.2 Outcomes of Consultation Process	1
1.3 Moving Forward	7
2. BACKGROUND	9
3. PUBLIC CONSULTATION PROCESS	10
4. EXTENT OF STAKEHOLDER ENGAGEMENT	13
5. ANALYSIS OF COMMENTS RECEIVED	15
5.1 General comments	16
5.2 Analysis of Response Form questions	22
5.3 Specific comments on sections of the Architecture documentation	27
6. LESSONS FROM THE CONSULTATIVE PROCESS	30
APPENDIX A - PUBLIC CONSULTATION SESSIONS	32
APPENDIX B - FORMAL RESPONSES RECEIVED	33
APPENDIX C - SOURCES OF INFORMATION	34
C.1 Persons consulted during course of review	34
C.2 HealthConnect Board	34
C.3 HealthConnect Stakeholder Reference Group (SRG)	35
C.4 Documentation and References	36
APPENDIX D - TERMS OF REFERENCE FOR DH4 REVIEW	37
APPENDIX E – ANALYSIS OF RESPONSES TO PARTICULAR ISSUES	38
E.1 Response Statistics	38
E.2 Response Profile	39

1. SUMMARY

1.1 Introduction

This report has been produced by Richard Dixon Hughes of DH4 Pty Ltd in response to a commission from the Design Section of the National eHealth Branch of the Department of Health and Ageing ('Department') to collate and analyse the responses to the national HealthConnect systems architecture consultation.

As described in the body of this report, the HealthConnect Systems Architecture ('HCSA') was launched, along with a range of other documentation, at a ministerial event in Hobart on Friday, 26 September 2003. It was then disseminated widely through presentations in each State/Territory capital plus Townsville and Ballarat, by posting on the Department's website and by distribution of information packs at key events and in response to stakeholder queries.

Over 1,000 copies of the HCSA and associated documents were distributed in these ways, along with a request for comment and a detailed response form for structured feedback. Feedback was originally sought by 28 November 2003 (subsequently extended to 20 December), with 22 responses being received by 28 February 2004. A further 8 responses were received in response to follow-up in March and April 2004.

The report examines issues arising from both the consultation process and the HealthConnect architectures and makes recommendations for further consultation processes and refinement of the HealthConnect architecture.

Some of the early findings of this review (predominantly related to process) were presented to the HealthConnect Stakeholders Reference Group (SRG) on 24 February. An interim briefing paper was distributed on 1 March 2004 and further feedback obtained from members of the HealthConnect Board through the Board meeting on 10 March 2004.

Most of the responses were very informative and made substantial contributions to the debate over the future design of HealthConnect. Nevertheless, the overall response rate was not high and several key stakeholder groups need to be better represented in the further development and implementation of HealthConnect.

1.2 Outcomes of Consultation Process

The consultation process (including discussion with the SRG and other stakeholders) has provided feedback on both the PROCESS of consultation and on the CONTENT of various aspects of HealthConnect – including:

- (a) the overall concepts and policies being pursued through *HealthConnect*,
- (b) the HealthConnect Business Architecture;
- (c) the HealthConnect Systems Architecture; and
- (d) the draft implementation plan for HealthConnect.

1.2.1 The Consultation Process

The HealthConnect Design Team has noted issues raised by stakeholders with respect to the consultation process, and expect to improve the consultation processes used in later stages of the HealthConnect program. The issues identified are summarised in section 6 of this report. It was particularly noted that:

- There needs to be a better match between the level and volume of material provided and the audience to which it is directed.
- Generalist stakeholders look to other persons with relevant expertise and resources to ensure that technical issues are appropriately addressed – the HealthConnect team needs to ensure that specialist stakeholders are engaged early in the process and that their feedback is available to general decision makers.
- Non-technical people should not be expected to work through highly technical material but should be able to obtain a trusted interpretation of its impact on their interests. Nevertheless, they should have the option of accessing the detailed material, if they desire.
- The gaps of coverage in comment on the HealthConnect Systems Architecture from key stakeholder groups need to be addressed in progressing the program.
- There were logistical problems with some of the consultation sessions, which the HealthConnect team need to avoid in future (particularly, excessively tight travel schedules that leave inadequate time for preliminary set-up or follow-up discussions, and use of cramped venues away from transport hubs).

Applying the feedback received to the completion of work on the HealthConnect Architectures, it is proposed that the following approaches be adopted:

1. Broader HealthConnect business issues and finalisation of the Business Architecture continue to be addressed to a wide range of stakeholders but with more targeted explanations and resolution of issues through informed, facilitated discussion of individual topics.
2. Complex technical issues be explored through interactions with small groups of experts and major stakeholders. Summaries of the outcomes of such considerations should be prepared and disseminated to the broader stakeholder community.
3. Where complex issues are being addressed, use of a facilitated workshop in addition to, or instead of, a questionnaire response provides a better way of getting considered feedback from a diverse stakeholder group.
4. More active involvement of a broader stakeholder community would help ensure HealthConnect meets real needs of different user communities, avoids wasteful duplication and provides more opportunities to improve health outcomes. Specific groups that respondents proposed be more involved in the development and implementation of HealthConnect include:
 - a) Nursing (particularly general and community nursing);
 - b) Aged and community care (including DoHA ACCD IM&T);
 - c) Health software suppliers;

- d) Aboriginal Controlled Community Health Services; and
- e) All allied health professions but particularly community/retail pharmacy.

1.2.2 Comments on HealthConnect policies and business issues

Consideration of written responses and from the verbal feedback at the Stakeholders Reference Group (SRG) and HealthConnect Board identified the following positions and issues with respect to HealthConnect policies and business issues.

1. There is continuing broad stakeholder support for the development of HealthConnect as a national project generally conforming to the HealthConnect Architecture documentation.

Notwithstanding some earlier uncertainty as to resources, support is expected to grow strongly following the Australian Government's announcement on 10 March that it would be contributing funds toward the next phase of HealthConnect.

2. There is general acknowledgment that the IRR and HealthConnect Systems Architecture documentation represents a concerted and substantial body of work dealing with most of the current issues in considerable depth.
3. There is a need to reach broad consensus with the wider stakeholder community over privacy and consent policies and the measures that will actually be implemented within HealthConnect to realise these policies. Outstanding questions indicate a need for a coordinated approach that engages with stakeholder concerns and includes legislative, operational and technical measures. Questions to be resolved include
 - (a) The consent model and its practical realisation;
 - (b) Consumer access to audit trails;
 - (c) Independent oversight of privacy, consent and access audit;
 - (d) Whether difficulties of data integrity and long-term record management can be overcome in such a complex federated architecture;
 - (e) Consent for secondary uses of personal health information;
 - (f) Establishing clear, succinct policies and procedures for privacy, consent (and access) that meet consumer and provider needs;
 - (g) Agreement on effective technical measures to be used to realise privacy and consent policies; and
 - (h) Possible role of independent technical assessment of privacy and consent provisions of the final HealthConnect systems architecture.

It is also argued by some stakeholders that early agreement of privacy and consent protocols will greatly enhance provider and consumer uptake of HealthConnect.

4. Policies and business approaches for identification, registration and access need to be resolved.
5. There is a need to resolve at the policy, business and technical levels the EHR data architecture and standard formats that will be accepted and managed by HealthConnect. This needs to be done in the context of developing the Data

Architecture, incorporating findings from the Clinical Information Project (CIP) studies and further consideration of EHR standards developments.

6. There is a need for greater cooperation between States, Territories and the Australian Government in agreeing and progressing the detailed *HealthConnect* agenda.
7. Some stakeholders strongly believe *HealthConnect* should be much more standards-based and should be explicitly designed to support relevant international, regional, Australian and industry EHR standards (including those produced under the auspices of the HDSC or NHIG) - the update of the Business Architecture needs to identify where conformance with relevant international, regional, Australian and industry standards is a business requirement.
8. As a broad policy issue, there are considerable risks in *HealthConnect* concepts not yet having been demonstrated on any significant scale prior to full-scale implementation at a whole-of-State level. These major risks must be actively managed with appropriate expertise. Plans must include expert reviews and advice from appropriately experienced professional systems engineers.
9. There is a range of unique legal questions that need to be pursued before an operational *HealthConnect* system can be developed and deployed with confidence. These are understood to be largely within the terms of reference of a current legal consultancy; however, once that work is done, binding decisions must be taken for the long term.
10. A range of clearer, accurate, succinct, documentation is needed setting out the scope of *HealthConnect* (with consistent interpretation for various stakeholder groups). This should be maintained as a shared resource of the Program Office.
11. More work is needed to improve the practical interaction between *HealthConnect* and various types of local front ends and to integrate *HealthConnect* information effectively with work procedures in clinical practices.
12. The level of resources, incentives and planning needed to ensure successful *HealthConnect* implementation and change management are expected to be considerable and have yet to be realistically identified. It is unlikely that there will be an innovative low-cost solution, so realistic policies need to be developed in order to firm up the overall program.
13. There is a strong sentiment that *HealthConnect* should not attempt to address any of the optional functions identified in the HCSA or duplicate functions of front-end systems.
14. It is noted that *HealthConnect* has the potential to deliver benefits through support for changing paradigms of health care delivery and that these opportunities need to be identified as part of benefits realisation.

1.2.3 General Comments on HealthConnect Architectures

The following points particularly relating to architectural issues were identified in general stakeholder responses:

1. There are significant risks in implementing a complex federated architecture that will need to be actively managed if HealthConnect is to achieve its objectives.
2. Adequate system performance must be delivered at the level of a clinical workstation.
3. The HCSA needs to give greater acknowledgement of, and support conformance with, international, regional, Australian and health industry standards.
4. The HealthConnect Architecture needs to describe EHR components in terms of relevant International standards in the EHR architecture area, such as CEN prENV13606, and must cross-reference these standards, wherever relevant.
5. While the use of XML for communicating EHR information is widely accepted, the role of XSD schemas, HL7, *openEHR* and other potential standards for defining the structure and content of EHR information remains unresolved and needs to be addressed in a wider work item finalising EHR data architecture and storage.
6. Using XML for information transfer is not sufficient to achieve semantic interoperability. Event summary data needs to be structured using a common set of meaningful XML tags (not allowing different tags for the same concept in different summaries).
7. Validation of XML data needs to be performed by an internationally recognised constraint-based technique (preferably archetypes).
8. The detailed sub-structure of event summaries must be defined consistently across different summary types and conform to ISO TS 18308 data structure requirements.
9. Consideration needs to be given to amending the HealthConnect Systems Architecture to reflect the pivotal importance of both EHR Lists and Event Summaries in the EHR data model.
10. HealthConnect should follow a range of good IT and systems engineering practices in the design, construction and deployment of the system, including:
 - (a) Avoiding complexity and adopting a simple, uncomplicated design;
 - (b) Ensuring that detailed standards, processes and work practices are developed and used during implementation;
 - (c) Having data validation as close to the source of the data as possible;
 - (d) Using heavily scalable architectures to obtain system performance and avoid unnecessary up-front investment;
 - (e) Storage, backup and recovery being to world best practice.

- (f) Defining logical layered protocols for interaction between HCSA and CIS/Access nodes, encompassing all areas of the overall HealthConnect requirement and conforming to standards, where they exist.
11. The performance of the access methods and the practical feasibility of the “subscription” access method needs to be reviewed.

1.2.4 Analysis of Response Questions

The analysis of stakeholder responses to the set questions in the response form may be summarised as follows (generally moving from the most supported propositions to the least supported):

1. There is clear support for:
 - (a) HealthConnect operating as a **passive store** rather than actively interpreting clinical information or initiating transfers of EHR information from provider systems.
 - (b) HealthConnect being kept as simple as possible and **not attempting to deliver optional functions** such as clinical decision support. It was identified that **provider systems should deliver optional functions** but HealthConnect needed to provide EHR information to support these functions.
 - (c) Use of **third party hosted storage** facilities for shared EHR rather than storing it on media held by the consumer or in various provider systems.
 - (d) Initially defining HealthConnect by means of a **reference implementation** supported by published policies, standards and systems, but stopping short of “full implementation”.
 - (e) **Data extensibility** being essential for longevity and future flexibility in the definition of EHR information.

Nevertheless, stakeholders do not consider that this can yet be readily achieved with current vendor technology and without disruption in the use of systems – clearly this is an area where HealthConnect will be a pioneer and needs to carefully heed lessons of the previous GPCG trials and the proposed BSHCT trial.
 - (f) Proceeding with HealthConnect as an evolutionary **system/project led development** rather than selecting an existing product as the reference implementation or undertaking a bespoke development.
2. While there was clear support for the principle of HealthConnect operating through vendor **front-end** products and in-house CIS systems, there was a very high level of uncertainty as to how and when this might be achieved.
3. The proposed adoption of a **three tier structure** (National, HRS and User) was supported but with a high level of uncertainty as to the ramifications of this architecture and a perceived lack of detail on how it would operate.
4. There is basic acceptance of the **federation paradigm** but considerable concern over how such a complex, diverse aggregation of systems will work, particularly if it is to be based on sharing components and/or software functions. DH4 suggests that the interactions between components be based on a layered

set of interface protocols (adopting recognised standards, wherever they exist). The associated questions about the number of repositories and restricting a person's EHR to just one repository were not well understood.

5. There is moderate support for the **three access methods** but concerns have been expressed about the proposed response times for the “messaging” and “transactional” methods and significant questions have been raised about issues of feasibility, complexity and control in the “subscription” method. These need to be considered alongside work on how HealthConnect information can be integrated into the business workflow and alternative applications/technology architectures for information exchange.
6. Finally, there was only weak support and considerable uncertainty as to whether the **implementation strategy** as described is feasible; however, this issue is already being progressed through the proposed implementation planning and benefits realisation consultancy.

1.3 Moving Forward

It is recommended that:

1. Detailed stakeholder feedback on policy and business aspects of HealthConnect provided in response to the IRR and HCSA be considered in the production of Version 2.0 of the HealthConnect Business Architecture.
2. Completion of Version 2.0 of the HealthConnect Business Architecture include more detailed exposition of, and agreement on: HealthConnect scope and functionality; structure, content and management of HealthConnect EHR information; integration of HealthConnect information with clinical workflow, registration and identification; and operation of the federation model.
3. An accelerated program of work be undertaken to resolve HealthConnect identification, registration and access policies and associated procedures required to implement them. This is to include focussed consultation with specialist stakeholder and systems design interests. This work should inform Version 2.0 of the HealthConnect Business Architecture.
4. An accelerated program of work be undertaken to resolve HealthConnect privacy and consent policies and the means of implementing them to include focussed, facilitated consultation with stakeholder, community and systems design interests. This work should inform Version 2.0 of the HealthConnect Business Architecture.
5. An accelerated program of work be undertaken to advance the resolution of issues surrounding the content, internal structure and use of the HealthConnect EHR, event summaries, and EHR extracts, taking into account:
 - (a) the findings of the Clinical Information Program;
 - (b) relevant EHR architecture, EHR content and messaging standards; and
 - (c) the impact of HealthConnect information on workflow and practices in the clinical workplace, and also

Informing both Version 2.0 of the HealthConnect Business Architecture and the HealthConnect Data Architecture.

6. A clear, accurate overview of the HealthConnect system, outlining its scope, be produced in conjunction with Version 2.0 of the HealthConnect Business Architecture and be maintained as a shared resource of the Program Office (rather than as a by-product of the Systems Architecture), eventually superseding Version 0.9 of the HealthConnect Architecture Overview.
7. With the exception of elements of the Data Architecture associated with EHR structure and content, work on the HCSA be deferred until the above accelerated programs of work are substantially completed and key operational and business issues are resolved, ready for incorporation into Version 2.0 of the Business Architecture.
8. Version 0.9 of the HCSA be adopted as a working document for use during the development of Version 2.0 of the Business Architecture with required changes being identified for incorporation into later design documentation.
9. A copy of the NHDD (and any other approved HDSC or NHIG document) and a full set of relevant ISO, CEN, HL7 and ASTM standards (including draft standards and technical specifications) relevant to HealthConnect be maintained in the Design Branch in both hard-copy and electronic form.
10. When the proposed Implementation Architecture (including the Data Architecture, Applications Architecture and Technology Architecture) and the revised HealthConnect Implementation Plan are complete, a completely independent review by external professional systems engineers with software engineering credentials be carried out to assess and advise on technical feasibility, schedule, risk management and resourcing of the revised HealthConnect program.

2. BACKGROUND

This report is produced for use in furthering the objectives of the HealthConnect program being conducted as a joint initiative of the Australian, state and territory governments.

The overall goal of HealthConnect is to establish a national health information network to facilitate the safe collection, storage, and exchange of consumer information (in the form of electronic health records) between authorised health care providers.

The target audiences for this paper are HealthConnect stakeholders and those within the Commonwealth Department of Health and Ageing ('DoHA') responsible for planning the delivery of HealthConnect outcomes. It is therefore assumed that the reader has a general knowledge of the HealthConnect program and its objectives.

The Design Section within the National e-Health Systems Branch of DoHA has particular responsibility for documenting how HealthConnect will operate and for defining the various components needed for its implementation. These aspects were particularly addressed in:

1. The HealthConnect Business Architecture, which defines the business functions being addressed by HealthConnect and their relationship to other business processes across the national health care sector.

Version 1.0 of the Business Architecture was prepared over some 18 months of iterative refinement, first being released for public comment (at version 0.7) on 11 April 2002. Following several rounds of comment, version 1.0 was finalised in April 2003 and officially launched in mid-2003. A consultancy has now been let for the review and update of the Business Architecture by mid-August 2004.

2. The HealthConnect Systems Architecture ('HCSA'), which defines the data, applications and technology frameworks that are needed to implement the HealthConnect business architecture. Preliminary work on the HCSA was undertaken in mid-2002, leading to Coolong Consulting being retained in November 2002 to undertake the initial development of the Architecture.

The current Version 0.9 (final discussion draft) of the HCSA was first delivered in April 2003. Following extensive review within the wider HealthConnect Program Office and comparison with work being carried out for the HealthConnect trials, this version was officially launched at a Ministerial function on Friday, 26 September 2003 and circulated widely for public consultation.

3. Eleven other documents were prepared in association with the HealthConnect Systems Architecture. Of these, two were specifically provided to stakeholders for feedback along with the Systems Architecture; they were:
 - (a) the HealthConnect Architecture Overview (draft version 0.9) ('HCAO'); and
 - (b) the HealthConnect Implementation Strategy (draft version 0.9) ('HCIS').

Five other associated documents were made available in electronic form on the HealthConnect website and on the Systems Architecture CD-ROM provided to

stakeholders but were not specifically cited in the request for stakeholder feedback.

Included in the same launch on 26 September were the results of the 3-volume *HealthConnect* Interim Research Report (**'IRR'**) (also available online and on CD-ROM) – a compendium of 14 further reports.

A response form was provided as an aid to assist stakeholders in providing feedback on the *HealthConnect* Systems Architecture. The response form sought general feedback on the HCSA, answers to 16 key questions about underlying concepts in the HCAO, HCSA and HCIS and also invited respondents to raise any issues about specific clauses or sections of this documentation.

As at 31 January 2004, 21 responses had been submitted by stakeholders.

On 10 February 2004, the Design Section retained DH4 Pty Ltd to perform a review of the responses received, take into account feedback from the Stakeholder Reference Group on 24 February 2004 and to produce an interim briefing paper and this report.

DH4's original terms of reference are attached at Appendix D for information.

As a result of initial feedback, further stakeholder responses have been actively pursued as outlined in section 3 below.

3. PUBLIC CONSULTATION PROCESS

The public consultation process on the *HealthConnect* Systems Architecture commenced in Hobart on 26 September 2003, with the launch of the Architecture by the then Federal Minister for Health and Ageing, Senator the Hon Kay Patterson, and the Tasmanian Minister for Health and Human Services, The Hon David Llewellyn MHA. The findings of the Interim Research Report (IRR) were launched at the same event.

Following the launch, the latest HCSA, HCAO and HCIS documentation was made available through the *HealthConnect* web site (www.healthconnect.gov.au) along with a response form seeking stakeholder comments.

Hard-copy documentation and CD-ROMs had been prepared in advance for the launch and for subsequent consultation sessions, which were held in each capital city plus Townsville and Ballarat between 13 and 31 October. The material available for stakeholders to collect at each session included:

1. Copies of a bound volume "*HealthConnect* Draft Systems Architecture", (**'SA-Volume'**) containing:
 - (a) An introductory preface plus a summary of all *HealthConnect* Architecture documentation and directions as to where to find it;
 - (b) Draft Version 0.9 of the *HealthConnect* Architecture Overview (HCAO) (54 pages);
 - (c) Draft Version 0.9 of the *HealthConnect* Systems Architecture (HCSA) (71 pages); and

- (d) Version 0.9 of the HealthConnect Implementation Strategy (HCIS) (33 pages),
2. Copies of a 17 page response form booklet entitled: "HealthConnect Systems Architecture Project: Phase 2 – Systems Architecture Development: Response Form" (**'Response Form'**). In many cases, a Response Form was loosely inserted into the SA-Volume, in order to draw attention to it.
3. CD-ROMs, each containing pdf versions of the SA-Volume, Response Form and six other secondary documents related to development of the Systems Architecture.
4. Hard-copies of the three-volume final version 1.0 of the IRR.
5. CD-ROMs each containing pdf versions of the final version 1.0 of the IRR.

Invitations for the launch in Hobart and subsequent consultation sessions in other centres were sent out by email from each State's HealthConnect Program Office, were publicly posted on the Internet and were passed on by personal contact. The invitations to the presentations indicated that stakeholder feedback was being sought on both the IRR and the HCSA.

Further information on the location, timing, organisation and attendance at each of the consultation sessions is provided in Appendix A. Each consultation session included 3 parts, covering:

1. An introduction and overview of HealthConnect progress followed by a review of outcomes from the IRR;
2. An exposition of the HealthConnect architecture based on the HCAO document (which touches on significant business issues as well as questions of data, applications and technology); and
3. An opportunity for stakeholder feedback

Discussion was driven by input from the floor and canvassed a wide range of issues raised by both the IRR and the Systems Architecture. The total attendance for the IRR/HCSA presentation across all sessions is estimated at between 300 and 350 persons. Each session included the opportunity for stakeholders to take away copies of the materials listed above.

In Queensland, Queensland Health also organised a one-day follow-up workshop facilitated by a consultant from the META Group, the results of which were documented and submitted as stakeholder feedback.

In addition to materials on the IRR and HCSA being provided at the consultation sessions, interested stakeholders were also encouraged to write in or email the Department and seek copies of the materials, which were despatched in CD-ROM and/or hard-copy form, depending on the needs of the stakeholder. It is understood that a Response Form was included with each of the sets of material sent out in response to these queries. A total of 449 addressees were recorded by the Department

On the basis of remaining stock, a total of around 800 hard-copy versions of the SA-Volume and around 950 CD-ROMs have been distributed to stakeholders (although an unknown number of stakeholders took both a hard-copy and electronic version).

Most of 1000 officially printed Response Forms were also distributed and these were also available from the HealthConnect website.

Reviewing the statistics from the HealthConnect website provide the following estimates of hits recorded against key url's for the HCSA documentation:

Table 1 - HealthConnect website hits on Systems Architecture documents

Document (& url)	Sep/Oct	Nov	Dec	Jan	Total
HCA Overview (sa1-60.pdf)	882	194	38	210	1324
HC Systems Architecture (sa1-72.pdf)	447	82	59	74	662
HC Implementation Strategy (sais1-35.pdf)	154	27	16	34	231
Response Forms (rf2.pdf + rf2.doc)	75-100	25-30	28	15-21	143-179

These statistics cannot be used to determine the number of individual persons receiving HCSA material online because the same individual may access a URL several times. Nevertheless, they do indicate a level of interest in the HCSA during the commentary period.

The Response Form requested stakeholders to submit their comments by 28 November 2003 and 13 formal responses were received by early December. The deadline was subsequently extended to 20 December and a further 8 responses were received by 31 January 2004 (partly as a result of telephone follow up).

Additional oral comment was provided by the Stakeholder Reference Group on 24 February with one further written response being provided following the meeting.

Further feedback was sought from major stakeholders following a round of oral presentations at the HealthConnect Board, which met on 10 March 2004.

An interim Version 1.0 of this report was produced in final form on 19 February 2004, pending receipt of promised comments from major stakeholders.

As a result of this later consultation with the SRG and HealthConnect Board and other important stakeholders, a total of 30 responses were eventually received and are analysed in this report.

4. EXTENT OF STAKEHOLDER ENGAGEMENT

Stakeholder engagement during the presentations is reported to have varied from venue to venue and addressed a wide range of issues raised by the IRR, with less detailed discussion of matters relevant to the HCSA. Delivery of the presentation material (52 overheads) took a considerable proportion of the available time at some venues and restricted the time available for feedback on specific systems architecture issues.

It is understood that the HealthConnect team did not maintain written records of general discussion during the consultation sessions; however, those present from the HealthConnect team were usually able to glean considerable feedback both during and after the consultation session and also to provide explanations. The main exceptions appear to have been Perth and Melbourne, where the available time for general discussion was heavily constrained by the tight travel schedule and, in the case of Melbourne, logistical difficulties.

In total, 30 formal responses on the HealthConnect Systems Architecture were eventually received and are listed in Appendix B. These range from three-quarters of a page up to around 25 pages in length and include both general and specific commentary. The distribution of responses among some of the potential interest groups is shown in Table 2 on the next page.

By any measure, the formal response to the public release and consultation over the HealthConnect Systems Architecture has been weak in terms of volume; however, all of the responses actually received make a useful contribution to the further development of this important national program. In particular, several contributions were received that represent a considerable amount of effort on the part of very well informed stakeholders. These included those provided by:

- (a) Monash University School of Health Information Management & Systems and Faculty of Law;
- (b) The Commonwealth Privacy Commissioner;
- (c) Several organisations serving the Health IT community;
- (d) Feedback from Meta Group Workshop convened for Queensland Health;
- (e) The nursing profession, represented by RCNA/ANF; and
- (f) The GPCG and Divisions of General Practice;
- (g) Those involved with HealthConnect trials, particularly DSTC, Queensland Health and Trilogy Information Solutions.

It was also noted that some important stakeholders such as HealthConnect Program Office representatives and some of those involved in trials had been heavily engaged in consideration of the Systems Architecture prior to the public consultation stage. These people felt that they had already made a contribution from within the project and did not formalise their input as 'public comment'. These stakeholders were better represented after the final round of follow-up in February/March 2004. The difficulty of feedback from these stakeholders has highlighted the need for a more focussed request, when feedback is being sought from within the existing "HealthConnect community", which is facing increasing time pressures as the project moves forward.

Table 2 - Formal responses received (by stakeholder group)

Stakeholder Group	Responses	Comment
Primary Care Providers & Organisations	6	
Health Care Providers – Specialist/Diagnostic	0	Definitely under represented
Other Health Professions and Academics	2	
Hospitals/ Health Services	1	Definitely under represented
State & Territory Health / Government	4	NSW, Vic, SA, Tas not represented
Legal/ ethical/ consumer	1	Under represented
Commonwealth - AIHW	1	
Commonwealth – DVA	1	
Commonwealth – Privacy Commissioner	1	
Commonwealth – Other DoHA	1	Definitely under represented
Health Standards Groups	1	Under represented
Health IT Industry	6	
IT Practitioners	4	
ATSI - Indigenous	0	Addressed in 1 other response
Combinations of the above	1	
Total:	30	

Notes:

1. Although each response has been allocated to a single stakeholder group, in fact, some responses represent multiple stakeholder interests and there was one response that addressed the outcome of a workshop involving many different stakeholders.
2. A substantial response has also been prepared by the HIC and will be submitted as soon as it has been fully reviewed.
3. Some groups (eg consumer interests, more populated States, some health professional groups) did not make formal written responses but were prominent in discussion of the topic in feedback sessions at the SRG and HealthConnect Board.

5. ANALYSIS OF COMMENTS RECEIVED

Responses to the HCSA documentation received were examined with a view to identifying issues and classifying them into the following categories:

- (a) Commentary related to General *HealthConnect* policy;
- (b) Commentary related to the *HealthConnect* business architecture;
- (c) Feedback on *HealthConnect* systems architecture;
- (d) Commentary related to the consultative processes used to inform stakeholders and to obtain feedback on the *HealthConnect* systems architecture.

Analysis of the commentary on consultative processes has identified a series of lessons learnt, which are briefly discussed in Section 6 of this report.

The response form distributed with the public comment documents allowed respondents to indicate several levels of consent for publication and attribution of the responses. Most, but not all, respondents that submitted comments consented to attribution of their responses. A list of respondents (in a different sequence to the presentation of details) is provided in Appendix B. It is understood that the Department of Health and Ageing are planning to post comments received for publication on the *HealthConnect* website.

Use of the formal response form was optional but it was partly or wholly followed by many of the respondents. It sought information in three separate ways:

- (a) It firstly sought general comment on the *HealthConnect* Architecture. Largely based on the responses to this section of the Response Form, DH4 summarised these general comments in a digested form in an internal working report. Many general comments provided by respondents as answers to later questions or submitted by means other than via the response form were also treated as general comments. These comments were then reviewed and grouped, with the results being discussed in Section 5.1 below.
- (b) The second section of the Response Form sought responses to 16 specific questions about the *HealthConnect* Architecture. Comments submitted in response to these questions (or otherwise related to them) were analysed as outlined in Section 5.2 below. The presence or absence of a response from each respondent to each question was noted and, if present, the response was given a simple code to indicate the extent to which it generally confirmed or denied the proposition being put and the nature of additional comment.
- (c) The third and final section of the Response Form sought "Specific Comments" on the architecture. While it was intended by the authors of the Response Form that these comments be referenced to particular sections of the documentation, few cross-referenced comments were actually received under this heading. Detailed comment on particular sections of the Architecture documentation was included in the digest prepared by DH4 and is briefly discussed in Section 5.3 below.

5.1 General comments

All but two of the 30 responses analysed contained general comments (or specific comments or responses that were deemed to be “general comment” on further analysis). On analysis, 134 individual propositions of general importance were identified across all of the 30 responses received which, when analysed further, yielded some 30 or so general propositions, of which the more significant may be grouped as follows:

Policy and Business Issues

Issue	Explanation/Comment
<p>1. The need for representation by a broader range of relevant stakeholder interests in advising on HealthConnect policy and participation in developing and trialling HealthConnect functionality.</p>	<p>A variety of commentators suggested that closer involvement of a broader stakeholder community would help ensure HealthConnect met real needs of different user communities, avoid wasteful duplication and provide more opportunities for it to improve health outcomes. Specific groups that respondents proposed for greater involvement in the development and implementation of HealthConnect included:</p> <ul style="list-style-type: none"> a) Nursing (particularly general and community nursing); b) Aged and community care (including DoHA ACCD IM&T); c) Health software suppliers; d) Aboriginal Controlled Community Health Services; and e) All allied health professions but particularly community/retail pharmacy.
<p>2. The need to reach broad consensus with the wider stakeholder community over privacy and consent policies and the measures that will actually be implemented within HealthConnect to realise these policies.</p> <p>It is argued that early agreement of privacy and consent protocols will greatly enhance provider and consumer uptake of HealthConnect .</p>	<p>Specific issues raised in the context of privacy and consent include:</p> <ul style="list-style-type: none"> a) The extent to which multiple or layered consumer consent will be provided and the means by which this will be supported by the HealthConnect architecture; b) Legislative and operational measures to ensure that consent is informed and free; c) Consumer access to audit trail – scope, limitations, rights and practical operation (including whether single point of request will be provided); d) Operational and technical processes for administration of privacy, consent, access audit and longevity of record management metadata in a federated architecture; e) Legislative and operational measures for independent oversight of consumer and provider interests; f) Policies and procedures relating to secondary uses of personal health information; g) Progression of associated legal and systems issues including liability questions and the means of secure identification for consumers and providers; h) Demand for succinct, agreed statements and summaries of consent policies and procedures attuned to the needs of consumers and providers;

Issue	Explanation/Comment
	<p>i) Agreement and, possibly, independent expert review of technical measures to be used to realise privacy and consent policies (including immediate update of systems architecture to reflect final policy).</p> <p>k) Being informed by the outcomes of the eConsent project at: www.health.gov.au/hsdd/primcare/it/econsent.htm.</p>
3. Resolution of policy and business approaches for identification and access.	Broad support for an effective scheme to manage sensitive provider and consumer keys over long periods of time needs to be obtained by resolving inter-related policy, operational and technical issues.
4. Resolution of business requirements surrounding the EHR architecture and event summaries.	<p>While the EHR architecture is technical in nature, the forms of EHR information HealthConnect will handle encompasses important policy, business, governance and technology questions.</p> <p>Questions such as whether, when and how HL7, openEHR, ISO/CEN and local data formats will or will not be supported need to be resolved.</p>
5. Need for greater cooperation between States and conformance with international, regional, Australian and industry standards	<p>Industry stakeholders find the diversity of approaches and technology encouraged by individual State-based initiatives is a major cost driver. It also makes national policies harder to implement. Several stakeholders are seeking greater commonality of approach between States.</p> <p>Some also strongly believe HealthConnect should be much more standards-based and should be explicitly designed to support relevant international, regional, Australian and industry standards (including those produced under the auspices of the HDSC or NHIG).</p>
6. The viability of HealthConnect concepts have not been demonstrated on any significant scale.	Full-scale implementation in Tasmania and South Australia provides some opportunity to identify and resolve issues; however, these will still need to be supported by national infrastructure and retro-fitting substantial changes to any full-scale HealthConnect implementation will lead to significant operational and cost impacts. Plans must include expert reviews and advice from appropriately qualified and experienced professional systems engineers.

Issue	Explanation/Comment
7. There are a range of unique legal questions that need to be pursued before an operational HealthConnect system can be developed and deployed with confidence.	<p>Legal issues (particularly those related to liability) are the subject of a separate consultancy, presently underway. Resolution may require a combination of legislation (across jurisdictions), agreements, operational measures and technical safeguards. Legal issues identified by stakeholders have included:</p> <ul style="list-style-type: none"> a) Cross-jurisdictional ownership of, and long-term responsibility for, EHRs, EHR extracts, event summaries, audit trails and associated metadata; b) The evidential importance of views in the provider's record of care and potential conflict with access/consent rules; c) Use of the summary extract as evidence; d) Potential liability for gaps in record coverage or acts/omission related to usage or supply of extracts; and e) Contractual protection of data in outsource service environments.
8 A range of clear, accurate, succinct , documentation is needed setting out the scope of HealthConnect (with consistent interpretation for various stakeholder groups).	A range of such documentation is required, and should be developed as part of current work on Version 2.0 of the Business Architecture. This should be accompanied by a more detailed, precise and accurate description of the HealthConnect system (replacing Version 0.9 of the HCAO).
9 Integration of HealthConnect information with work procedures in clinical practices.	<p>The practical interaction between HealthConnect and work procedures in various types of clinical practice needs considerable work to ensure maximum, trouble-free uptake of HealthConnect.</p> <p>The HealthConnect architecture needs to resolve how its information flows will integrate with, and be managed in conjunction with, local information (particularly large CIS applications) – including handling of data validation and rejected transactions.</p> <p>The use of locally stored views within a CIS raises issues of access control and audit trail management.</p>
10. Level of resources, incentives and planning and needed to address HealthConnect implementation and change management.	<p>It has been observed that HealthConnect is almost certain to fail if the change management and implementation support program and the professional and public education and awareness campaigns are inadequate.</p> <p>In this regard, many stakeholders have sought financial and technical support for the development and implementation of common approaches). Stakeholder groups suggested as recipients of incentives include: Divisions of General Practice, the community and aged care sector; software suppliers; and Aboriginal health.</p> <p>Specific issues affecting implementation include the need for policies and incentives to encourage providers to share patient information.</p>

Issue	Explanation/Comment
11. Whether HealthConnect should attempt to address any of the optional functions identified in the HCSA or duplicate functions of front-end systems.	<p>There is a strong sentiment that HealthConnect should not seek to provide these optional functions in its own right but, rather, provide relevant information in ways that can be used by front-end systems.</p> <p>Respondents highlighted the need for HealthConnect to focus on effective management of EHR extracts (which are sufficiently complex in their own right) and not to be diverted into value-added interpretation, workflow and CDSS.</p> <p>The potential exception is to package an e-discharge and referrals capability as part of the system (but even this might be better sourced from outside HealthConnect).</p>
12. HealthConnect has the potential to deliver benefits through support for changing paradigms of health care delivery.	<p>Examples include:</p> <ul style="list-style-type: none"> a) Providing information support for changing patterns of attendance by young people at general practice clinics. b) Providing the access to information needed by community pharmacists, nurses and other allied health professionals to contribute more effectively to the care of individual patients, by avoiding errors caused by inadequate information.

Systems and Technology Issues

Issue	Explanation/Comment
1. Managing the risks of implementing a complex federated architecture.	<p>Whilst there is general acceptance that a form of federated architecture will be used for HealthConnect (if mainly for political reasons), points have been raised about various aspects of the approach, including:</p> <ul style="list-style-type: none"> a) If this paradigm is allowed, it is almost certain that there will be more than one physical implementation of an HSRA and, probably, several, each running in a different systems environment. b) It is almost impossible to develop, test, maintain and provide long-term support for a standard set of distributed software components for deployment on different platforms, integrated with different applications (an alternative initial focus might be on a set of common HealthConnect Interface Protocols). c) The difficulties of effectively establishing, managing and maintaining common services and functions (eg. access control and audit) across a functionally diverse, replicated, nationwide system in the long-term have been greatly underestimated – a simpler design needs consideration.
2. System performance at the clinical workstation	<p>Several stakeholders did not consider the times given in the HCSA for performance in clinical settings satisfactory. This needs to be reviewed in the wider context of the structure and content of HealthConnect information and its integration into workflow in the clinical workplace.</p>

Issue	Explanation/Comment
<p>3. Need for greater acknowledgement of and conformance of HSCA documents with international, regional, Australian and industry standards.</p>	<p>Industry stakeholders find the diversity of approaches and technology a major cost driver. Some stakeholders propose that <i>HealthConnect</i> be standards-based and should be designed to support relevant international, regional, Australian and industry standards (including those produced under the auspices of the HDSC or NHIG).</p> <p>The HCSA and HCAO documents were strongly criticised for being weak in this area and for not demonstrating adequate understanding of health informatics standards or IT practices widely used throughout the industry – there remains considerable danger that the architecture is weak in this area – with significant cost and feasibility implications. These questions are of such significance that they are business rather than technology issues.</p> <p>It was recommended that the sub-structure of event summaries must be defined consistently across different summary types and conform to ISO TS 18308 data structure requirements.</p>
<p>4. While the use of XML for communicating EHR information is widely accepted, the role of XSD schemas, HL7, <i>openEHR</i> and other potential standards for defining the structure and content of EHR information is not yet resolved</p>	<p>Questions about data extensibility, alternative architectural models, and application of common health industry approaches need to be resolved by means of focussed and facilitated discussion (in conjunction with deliberations over EHR content, structure and governance.)</p> <p>The recommended use of XSD schemas as the method of defining “extensible” EHR content was contested by respondents with considerable expertise in these matters.</p>
<p>5. Appropriate representation and validation of information in event summaries (and views)</p>	<p>Experts noted that using XML for information transfer is not sufficient to achieve semantic interoperability. Event summary data needs to be structured using a <u>common</u> set of meaningful XML tags.</p> <p>Validation of XML data needs to be performed by an internationally recognised constraint-based technique (preferably archetypes).</p>
<p>6. Whether the role of EHR Lists should be separately identified as components of the EHR</p>	<p>Consideration needs to be given to amending the <i>HealthConnect</i> Systems Architecture to reflect the pivotal importance of both EHR Lists and Event Summaries in the EHR data model.</p>

Issue	Explanation/Comment
<p>7. HealthConnect should follow good IT and systems engineering practice in the design, construction and deployment of the system.</p>	<p>Guidance provided by stakeholders includes:</p> <ul style="list-style-type: none"> a) Ensuring that a simple, uncomplicated design is adopted; there are massive risks involved in a project of this magnitude, many of which can be minimised by avoiding unnecessary complexity; b) Ensuring that detailed standards, processes and work practices are developed and used during implementation; c) Data validation should occur as close to the source of the data as possible; d) Heavily scalable architectures should be used to obtain system performance and avoid unnecessary up-front investment; e) Storage, backup and recovery should be to world best practice. f) Logical layered protocols should be defined for interaction between HCSA s and CIS/Access nodes, encompassing all areas of the overall HealthConnect requirement.
<p>8. The practical feasibility of the “subscription” access method needs to be re-visited.</p>	<p>Several respondents commented on difficulties in the practical realisation of this access method, particularly if the privacy, consent, access and record integrity requirements are to be fully observed. DH4 considers that some alternative approaches deserve consideration.</p>

5.2 Analysis of Response Form questions

Further details of the analysis of the questions on the response form are provided in Appendix E to this report. The analysis of responses to the questions yielded the following outcomes.

5.2.1 Passive Store Operating Paradigm

Q.01: *Is the adoption of a passive store paradigm for HealthConnect appropriate/sensible?* [Bal: +84%; UC: 9%]¹

There is clear-cut support for the proposition that HealthConnect should operate as a passive store neither pulling or pushing data to provider systems (other than on request) nor performing complex clinical interpretation or analysis of clinical data. There is a strong belief among many stakeholders that HealthConnect should be kept as simple as possible to maximise the likelihood that it will be both useful and successfully implemented.

5.2.2 Data Extensibility Operating Paradigm

Q.02: *Is an extensible data paradigm the most appropriate approach to manage the future proofing of shared EHR information that may be required for over one hundred years?* [Bal 68%; UC: 19%]

Q.03: *Are industry and user support services capable of delivering and supporting HealthConnect if it is based on an extensible data paradigm? If not, when might they be in a position to do so?* [Bal: -6%; UC: 52%]

While the stakeholders are clearly in favour of HealthConnect having data extensibility they have expressed significant reservations about the ability of contemporary software products to support this feature in transparent ways that do not make using the system complex and difficult to use.

The use of XML for exchange of EHR data is generally supported but the proposal to use XSD schemas and local EHR definition over other health industry standards approaches remains highly controversial. These matters need to be resolved as part of the next round of developing the HealthConnect Business Architecture.

¹ Through this section, the indicative support for the proposition in each question is given after each question in square brackets. “Bal” refers to the balance of opinion – which theoretically ranges from -100% to +100%; however any low or negative score indicates a potential issue requiring further consideration. The uncertainty “UC” can range from 0% to 100% - uncertainty over 35% is treated as being significant.

5.2.3 Federation paradigm

Q.04: *Is a federation paradigm the most effective approach for HealthConnect?*
[Bal: 48%; UC: 29%]

Q.05: *Is limiting the number of data repositories necessary/appropriate?*
[Bal: 15%; UC: 41%]

Q.06: *Is constraining an individual's record to just one data repository appropriate?* [Bal: 35%; UC: 45%]

There was a moderate degree of uncertainty in the respondents' answers to these three questions, particularly questions 5 and 6 (which were really seeking balanced opinions about complex technical performance and data management issues beyond the ken of most respondents).

While there is pragmatic acceptance of the federated paradigm, several respondents raised significant issues relating to the complexity of the model and difficulties still needing to be addressed.

Once the development of the Systems Architecture has proceeded to the next stage, consideration should be given to engaging independent professional systems and software engineers to validate the final systems architecture and implementation plans.

5.2.4 Local Front End

Q.07: *Will vendors be capable/interested in providing the functionality in their systems required to satisfy this operating paradigm?* [Bal: 62%; UC: 53%]

While respondents generally consider that vendors will ultimately agree to address HealthConnect functionality in their systems, the responses to this question indicated considerable uncertainty as to whether, how and when this might occur. Factors stressed in many of the responses included:

- (a) Vendor support for delivery of HealthConnect functionality is connected to the question of incentives or payments to justify the cost of resources required to participate;
- (b) States (and their incumbent vendors) need to be prepared to work toward adoption of a single, national approach, wherever possible in order to encourage vendor participation.

5.2.5 EHR Reference Framework

Q.08 *Can HealthConnect meet user needs through the supply of information to support the optional functions?* [Bal: 26%; UC: 55%]

Q.09 *Will provider systems deliver the optional functions?* [Bal: 66%; UC: 44%]

Q.10 *Should HealthConnect extend to delivering some optional functions?*
[Bal: -17%; UC: 28%]

There was such strong feeling about the risks of HealthConnect attempting to deliver any of the optional functions (highlighted by the -17% balance of opinion) that some respondents did not clearly distinguish between Q.10 and Q.08, when responding to q.08.

Although some respondents saw benefits in the development of optional features within *HealthConnect*, a clear majority was definitely opposed, primarily on the grounds of complexity risk. Should any functional extensions be contemplated, they are going to need to be straight-forward and comprehensively justified.

Even though respondents believe vendors (and not *HealthConnect*) should supply optional functions, high levels of uncertainty in the responses indicate that respondents remain unsure whether vendors are able to provide the required functions at present, or whether they are likely to be able to do so in the foreseeable future.

5.2.6 Storage option

Q.11: *Is a third party hosted storage service the most appropriate solution for HealthConnect?* [Bal: 77%; UC: 21%]

There is unambiguous support for the option of using a third party hosted storage service to hold EHR information, separate from either existing provider or potential consumer IT systems.

Some concerns were expressed should this service be outsourced to a private sector operations centre.

5.2.7 Access methods

Q.12: *Are the three access methods described appropriate for a shared EHR like HealthConnect?* [Bal: 46%; UC: 32%]

Had this question been asked in three parts, the answer would have been strongly in favour for the “messaging” and “transaction” methods and considerably less for the “subscription” service; however, there were also comments from clinical representatives that the proposed response times for all the proposed access methods are far too long to be practical.

Even though the subscription access method offers superior performance in some situations, there were significant reservations about its feasibility in the form proposed and its ability to effectively support key elements of the *HealthConnect* architecture. It was noted that stakeholder support for the subscription model was greater among state/territory stakeholders.

More work is required on the requirements for the access methods, particularly the “subscription” method.

5.2.8 HealthConnect Conceptual Systems Structure

It is proposed *HealthConnect* have a 3-level structure to manage the co-ordination of the federated storage solution. This will comprise:

- (a) The *HealthConnect* National Coordination layer.
- (b) The *HealthConnect* Records Systems layer.
- (c) The User layer.

Q.13: Is the proposed structure for HealthConnect appropriate?

[Bal: 57%; UC: 46%]

While the “Balance” is in favour, it is accompanied by a high level of uncertainty about the proposed 3-tier structure. The views of several respondents are summarised by the words of one: “*The information is so general that no useful comment can be made*”.

Given the importance of this structure to the ultimate design of HealthConnect, more detailed feedback should be sought from key stakeholders that have an appreciation of the associated technical issues.

Some of the concerns about the structure are associated with questions about how much the ultimate implementation of these concepts will handle information based on “open” Health Records standards, compared with locally defined HealthConnect standards. Issues surrounding access to national data sources and the lack of other detail or connecting lines in the diagram provides little about which to comment, although there is further detail in the HCSA document.

5.2.9 Implementation Strategy

The implementation strategy presented in the documentation describes the general approach to the realisation of the HealthConnect systems. It was not meant to be a detailed implementation plan but focused on understanding dependencies and the general sequence of the systems implementation activities.

Q.14 Is the implementation strategy realistic? [Bal: 33%; UC: 46%]

There is only moderate agreement with this proposition coupled with high uncertainty. The main reservations about the implementation strategy as presented appear to be:

- (a) A perception that there are still significant policy, business and systems issues to be resolved at a national level before any meaningful Implementation can be planned;
- (b) The need for greater engagement and commitment by the States to any implementation program and development of the associated inter-dependencies;
- (c) The need for incentives and additional resources for vendors and major groups of users before development and implementation work required to implement HealthConnect is likely to be addressed; and
- (d) Unrealistically short time-frames.

DH4 notes that a more detailed implementation planning and benefits realisation study has been commissioned to address more detailed implementation planning.

5.2.10 Development approach

The implementation strategy suggests three levels of development approach that could be adopted for the implementation of HealthConnect. These are:

1. **System/Project Led Evolution**, the recommended approach;
2. **Product Based** Development; and
3. **Bespoke** Development.

Q.15 *Is the system/project evolutionary development approach the most appropriate for HealthConnect?* [Bal: 63%; UC: 27%]

There is relatively strong support for the system/project evolutionary development.

Nevertheless, while the proposal reflects current jurisdictional control, it is noted that there are significant risks that could easily lead to non-interoperable systems and long term issues associated with record preservation, accessibility and system fragmentation. It is noted that vendors also tend to support the model (possibly because it is less of a threat to incumbent supply arrangements than the two alternatives).

5.2.11 Reference Implementation

A HealthConnect Authority can define the reference HealthConnect implementation at the level of

1. **Policy** - establishing a set of national policies;
2. **Standards**, by establishing interoperability standards;
3. **Architecture**, by establishing a common system architecture;
4. **Reference Implementation**; and
5. **Full System Implementation**;

The Architecture documentation recommended that HealthConnect be defined to Level 4, in the form of a fully functional reference implementation of the HealthConnect system, supported by published policies, standards and system architecture.

Q.16 *Is the reference implementation level the appropriate level of system definition for HealthConnect?* [Bal: 72%; UC: 25%]

There is good support for the establishment of a reference implementation as the most appropriate level of “system definition” for HealthConnect.

There are suggestions that these should be based on supporting commercially developed implementations, rather than developing the implementation itself.

5.3 Specific comments on sections of the Architecture documentation

The comments on specific sections of the Architecture documentation focussed on the following areas. It is proposed that these comments be addressed in more detail, firstly during update of the HealthConnect Business Architecture to Version 2.0, and subsequently, during finalisation of individual components of the Systems Architecture.

1. HCAO 3.1.1.2 - Business case: The business case for HealthConnect was not performed with enough rigor to justify the major investment proposed.
2. HCSA s 3.3 - The audit trail concept described in the detailed HRSA Description only partially addresses long-term recordkeeping requirements.
3. HCAO ss 3.1.2.3 and 4.2.1. Various significant challenges to interpretation, terminology and appropriateness of EHR reference framework diagram and explanations.
4. HCAO 3.1.2.4.1 - Availability and performance. System availability should be specified more precisely to standards more relevant to clinical settings.
5. HCAO 3.3.2.2 - Application Domains. Fig 3-4 duplicates Consumer Information Systems and omits Clinical Information Systems. Need to check ISO/CEN definitions of EHRs.
6. HCAO 4.1.1.3. Health Record Standards. Draft ISO EHR definitions should be used by HealthConnect and will supersede the previous HINA definition of EHR. Section heavily criticised for inaccuracies. AIHW also sought mention of the NHDD and the role of HDSC.
7. HCAO 4.1.2.2 - Decision support systems. The candidate decision support classification is unreferenced.
8. HCAO 4.2.2.1.3 – Views, Lists, Reports and Notifications. The concept of EHR Lists being views of the EHR is fundamentally flawed. EHR Lists are objects in their own right; they are created by clinicians; they are not programmatically derived from Event Summaries as suggested in this section.
9. HCAO 4.2.3.2 - Consent Based Access (p33). The proposed consent model is very sophisticated, onerous and difficult to achieve - it is unlikely to be feasible.
10. HCAO 4.2.3.2 - Consumer and Provider Identification (p33). The consumer identification function is dependent upon a national identifier to make it work.
11. HCAO 4.2.3.2 – Archiving (p34). The archiving strategy needs further development and is a major potential exposure. In particular, archiving issues affecting privacy requirements and disposal have not been fully considered.
12. HCAO 4.2.3.2 – Generic Interface (p34). The generic interface that can be used by consumers to create event summaries and view the EHR raises unresolved issues concerning security and authentication. In particular, what technical standards will be applied to secure these transactions across the web. Is PKI security practical. How will this be evaluated?
13. HCAO 4.2.4.1 - archiving and preservation function needs enhancement.

14. HCAO 4.2.4.3.1 - Preferred access model. Table 4-3 User perspective: From a user perspective, the interface response target should be sub-second no matter what access model is being used.
15. HCAO 4.2.4.2 – Management of record integrity, access, consent and audit trails in clinical information systems from many vendors. Further investigation of the relationship between the local clinical systems and *HealthConnect* is suggested.
16. HCAO 4.4 Standards. This section needs to refer to and expound contemporary EHR standards and standards under development. *HealthConnect* should not seek to establish standards in contravention of national standards policy.
17. HCAO 4.4.1.1 – Data Standards for Health Records. Contextual data such as location of service, profession and date are also relevant to point of care records (not just summary records). AIHW also raised sought mention of the NHDD and the role of HDSC.
18. HCAO 4.4.2.3 - Information security management. The first paragraph reference to HL7 security standards seems of secondary importance. The second paragraph should appear first (lightly reworded).
19. HCSA 1.6. While Popkin may be a very useful commercial tool, it is preferable for the UML models to be electronically distributed in an open standard format – eg. XMI and OCL.
20. HCSA 2.3.3 – Extensible data model (p13) – Retention of superseded formats. It is considered unrealistic to require HRS software to accept data in a superseded format for up to 10 years. A period of 3 or 4 years is more reasonable.
21. HCSA 3.3.3 - Security and Access Control. Refer to work on e-Consent Projects, funded by the Commonwealth. See details at: <http://www.health.gov.au/hsdd/primcare/it/econsent.htm>
22. HCSA 3.3.4.4 – Privacy and Consent Use Cases (p25). The requirement states that “Consumers grants specific people with specific levels of access” Apart from being unclear as to its extent, this requirement potentially introduces huge potential overheads and has major implication for the design and operation of the repository. Should we be giving consumers the ability to vary access to this degree?
23. HCSA 3.3.5.2 – Registration Responsibilities (p26). In the context of *HealthConnect*, what is really meant by “Allocation of *HealthConnect* aliases for consumers and providers.”? Does this refer to alternate identification or naming conventions? For providers, how does it relate to the provider directory?
24. HCSA 3.3.6.3 - Principles. Is storage as an XML BLOB rather than an attribute of a relational table important, provided that performance criteria can be met with the implemented technology?
25. HCSA 3.5.3.3 – Principles. XML is not currently specified for messaging of any clinical data in Australian Standards.
26. HCSA 4.1.2.4 - Preferred access model - Table 4-2. See comments against HCAO 4.2.4.3.1.

27. HCIS Implementation Strategy – depends on maintenance of the common policies over a wide area and long time and associated governance issues.
28. HCIS 2.2 – Preconditions for Success. A successful implementation strategy must deliver net financial benefits for providers and positive health outcomes for consumers – suggesting an “organic” rather than a “serial” rollout.
29. HCIS 3.1.1.2 – Standards Level of Realisation. The HealthConnect Authority should depend on interoperability standards which fit into the national health informatics standards agenda being driven by the ICT Sub Committee of NHIG.
30. HCIS 3.2 - A recommendation that any "reference implementation" be "open source" software.
31. HCIS 3.3.2 – Implementation Categories and Criteria. At the end of this section the Community pharmacist role is summarised as dispensing medicines. The professional practice of a pharmacist also involves providing primary care, and education on health and medicines.]
32. HCIS 4.2.1 – Governance. Rules and incentives are key elements in securing uptake.

6. LESSONS FROM THE CONSULTATIVE PROCESS

Commentary was sought and received from various sources on the lessons learned from the consultative process and the reasons for the relatively low response rate to the initial call for feedback using the Response Form. The following feedback and issues were noted:

1. The total volume of up-front information provided through the consultation process was far too great.
2. Combining the release of the IRR and the Systems Architecture in the same events provided a good overview of HealthConnect status but:
 - (a) this was not an effective way of focussing on systems architecture issues; and
 - (b) there was generally inadequate time for meaningful exploration of issues at the consultation sessions;
3. Future communications from HealthConnect should be much better tailored to the relevant audience.
4. While there is value in having full documentation available for use by any interested person, those with a clinical focus should not be expected to provide detailed comment on IT/systems issues without being able to get professional advice on the implications. Ways for HealthConnect to address this issue include providing summaries of the implications or, alternatively, resources to enable stakeholders to get their own advice.
5. Travelling roadshows are greatly appreciated but they must be much better organised and the travel itinerary must allow adequate time for set up and for offline discussion after the presentations.
6. Where complex issues are being addressed, use of a facilitated workshop in addition to, or instead of, a questionnaire response provides a much better way of getting considered feedback from a diverse stakeholder group.
7. Location and warning are important – at least one of the consultation sessions was not in a convenient central location and inadequate notice of the location was given, which affected some groups' ability to participate. Some venues were also cramped, with inadequate seating for all attendees.

To allow the greatest level of stakeholder participation, venues need to be large enough to accommodate the likely attendance and should be located centrally, close to public transport.
8. Notwithstanding the difficulties, there must be continued meaningful exchange of information between designers of IT processes and the ultimate user community to confirm that systems meet business needs. It is not enough to assume that user input to the business architecture will flow through to satisfactory systems.
9. To make a meaningful comment to such complex issues requires a major commitment of resources and adequate time to respond.

10. With the reduction in *HealthConnect* budget in 2003, some of the stakeholder community were reluctant to commit resources to something that was, at the time, appearing increasingly less likely to happen. *HealthConnect* needs to ensure that the continuing momentum of the program is well communicated.
11. There has been a lot of involvement and comment already – and an assumption by some stakeholders that what has been said several times before does not need to be said again. Stakeholders are looking to move forward – *HealthConnect* needs processes to ensure that key stakeholder input is distilled into useable form and applied in further development of *HealthConnect* concepts.
12. *HealthConnect* needs to ensure that a formal record of the outcomes of consultation sessions is kept for future reference – the failure to do this at the consultation sessions was a serious omission.
13. Significant groups of stakeholders (particularly nurses and allied health workers) feel disengaged from the consultation process and are seeking much greater consideration of their needs and interests.
14. The gaps of coverage in comment on the *HealthConnect* Systems Architecture need to be addressed as soon as reasonably possible.
15. Other stakeholder groups are looking to organisations having expertise in the application of large-scale IT (such as State governments and HIC) to take a lead in reviewing this complex material and identifying issues affecting that might concern all stakeholders. (Some members of the SRG have agreed to progress these issues).
16. The *HealthConnect* program office could have used more effective and earlier follow-up, particularly given the volume of the information and the fact that the end of year break intervened.

APPENDIX A - PUBLIC CONSULTATION SESSIONS

Details	Presenters/ Representatives	Comments
Hobart 1500, Friday, 26 Sep Salamanca Inn	HC/IRR: Fitzgerald Sys.Arch: Simson Other: Moore Convenors: McQueeney/ Hulme	<ul style="list-style-type: none"> Followed official launch of IRR by Ministers Patterson & Llewellyn (Tas). About 20 notified by email. About 30 attended presentation (mainly those involved in trial). 70 at launch.
Brisbane 1500, Monday, 13 Oct Queensland Health	HC/IRR: Fitzgerald Sys.Arch: Simson Other: Moore Convenor: Karen Gibson	<ul style="list-style-type: none"> >130 contacted by e-mail. About 55 attended. Active discussion (security, PKI &c) QH ran follow up workshop
Sydney 1000, Friday, 17 Oct Cambridge Park Inn	HC/IRR: Wooding Sys.Arch: Simson Other: Moore Convenor: Joanna Kelly	<ul style="list-style-type: none"> >130 contacted by e-mail About 65 attended. Active discussion (client identification, data matching)
Canberra 1000, Friday, 21 Oct Canberra Hospital	HC/IRR: Wooding Sys.Arch: Simson Other: Mount Convenor: Fred Pilcher	<ul style="list-style-type: none"> >95 contacted by e-mail About 50 attended (many DoHA & Canberra Hospital) Generally passive - a few questions
Ballarat 1000, Friday, 24 Oct Ballarat Base Hospital	HC/IRR: Aitken Sys.Arch: Moore Convenor: Gail Boschert	<ul style="list-style-type: none"> 108 e-mailed for Melbourne/Ballarat About 15-20 attended Active discussion (software applications & interfacing)
Townsville 1500, Monday, 27 Oct The Townsville Hospital	HC/IRR: Aitken Sys.Arch: Moore Convenor: Janet Askern	<ul style="list-style-type: none"> About 10 contacted by e-mail About 20 attended Quiet but generally appreciative (identification an issue)
Adelaide 1700, Monday, 27 Oct 77 Grenfell St	HC/IRR: Fitzgerald Sys.Arch: Simson Other: Mount Convenor: John Mleczko	<ul style="list-style-type: none"> About 65 contacted by e-mail About 50 attended. Active discussion (data structures, international standards).
Perth 0930, Tuesday, 28 Oct Dept of Health, WA	HC/IRR: Fitzgerald Sys.Arch: Simson Convenors: Terry Lennard/ Adrian Porteous	<ul style="list-style-type: none"> About 40 contacted by e-mail About 35 attended (inc Bunbury link). Discussion limited by time but positive (interest in progress with trials).
Darwin 0830, Wednesday, 29 Oct Crowne Plaza, Darwin	HC/IRR: Aitken Sys.Arch: Moore Convenor: Gloria Baillie	<ul style="list-style-type: none"> About 15 contacted by e-mail About 15-20 attended (mainly ex-trial) Quiet but generally appreciative
Melbourne 1400, Friday, 31 Oct Box Hill Hospital	HC/IRR: Fitzgerald Sys.Arch: Moore Convenor: Fiona Wilson	<ul style="list-style-type: none"> 108 e-mailed for Melbourne/Ballarat About 30 attended. Logistics problems meant little time for questions.

APPENDIX B - FORMAL RESPONSES RECEIVED

Respondent and/or responding organisation	Principal Class
Australian Institute of Health and Welfare (Richard Madden)	Cth (AIHW)
Michael Cass, c/- OATSIH, Patient Information & Recall Systems Team, DoHA	Cth (DoHA)
Dept of Veteran's Affairs (Jo Schuman)	Cth (DVA)
Office of the Federal Privacy Commissioner (Andrew Hayne)	Cth (Privacy)
Royal College of Nursing and Australian Nursing Federation	Health Professions (Nursing)
Pharmaceutical Society of Australia (PSA) (Mary Collins)	Health Professions (Pharmacy)
National Aged Care Industry Council and Aged and Community Services of Australia (ANHECA and ACSA) (Rod Young)	Health Services/Hospital
Anonymous (IT Industry)	IT Industry
BEA Systems (Peter Woodward)	IT Industry
Bob Kalkman, c/- TrakHealth	IT Industry
DSTC (Andrew Goodchild, Linda Bird, Mark Gibson)	IT Industry
Med-e-script Pty Ltd and Optimation (Dr Ian Colclough, Dr David Oppenheim)	IT Industry
Trilogy Information Solutions Pty Ltd (Steve Saunders)	IT Industry
Eric Browne, Managing Director, Montage Systems Pty Ltd.	IT Practitioner
Bruce Coller, c/- Hammond Care Group	IT Practitioner
Richard Harding, c/- Information Services, Qld Health	IT Practitioner
Vijay Shrotriya	IT Practitioner
School of Health Information Management and Systems and Faculty of Law, Monash University. (Dr Livio, Barbara Reed, Robert Meredith and A/Prof Bernadette McSherry)	Legal, Ethical, Consumer
Meta Group [Outcome of workshop for Queensland Health]]	Mixed
Australian Divisions of General Practice (Mark Brommeyer)	Primary Care
General Practice Computing Group (Mary Jamieson)	Primary Care
General Practice Division of Victoria (Bill Newton)	Primary Care
Ken Sampford, c/- Central Coast Divison of General Practice	Primary Care
Kerry Falvey, c/- Chermside Community Health - Prince Charles Hosp	Primary Care
Paul Hudson Donaldson, c/- The Prince Charles Hospital - QLD	Primary Care
Ocean Informatics (Peter Schloeffel)	Standards
ACT Health (Owen Smalley, CIO)	State/Territory (ACT)
NT Government (Stephen Moo)	State/Territory (NT)
Karen Gibson, c/- Information Services, Qld Health	State/Territory (Qld)
Department of Health WA (Adrian Porteous)	State/Territory (WA)

Note: A personal (rather than organisational) response is shown as c/- the organisation.

APPENDIX C - SOURCES OF INFORMATION

C.1 *Persons consulted during course of review*

1. Mr Paul Fitzgerald Assistant Secretary, National e-Health Systems Branch, Australian Government Department of Health & Ageing.
2. Dr Christopher Mount Acting Director, Design Section, National e-Health Systems Branch, Department of Health & Ageing.
3. Rob Moore Acting Director, Pre-Implementation and Project Planning, National e-Health Systems Branch, Department of Health & Ageing.
4. Dr Jane Aitken Director, Policy Coordination & Research, National e-Health Systems Branch, Department of Health & Ageing.
5. Kathy Smalley Design Section, National e-Health Systems Branch, Department of Health & Ageing.
6. Heather Grain Lecturer in Health Information Management, La Trobe University. Consumer Representative on Standards Australia Committee IT/14, Chair IT/14 Subcommittee on Health Concept Representation.
7. Adrian Porteous Director Information Systems, Corporate Office, WA Health, HealthConnect Program Office Representative for Western Australia.
8. Tam Shepherd Director Implementation, National e-Health Systems Branch, Australian Government Department of Health and Ageing
9. Adrian Beekmeijer Director Communication & Stakeholder Relations, National e-Health Systems Branch, Australian Government Department of Health and Ageing

C.2 **HealthConnect Board**

(Attendees at meeting of 10 March 2004)

1. Dr Robert Wooding First Assistant Secretary, Information & Communications Division, Australian Government Department of Health and Ageing (Chair, HealthConnect Board)
2. Ms Margaret Brown Chairperson, Health Consumers of Rural and Remote Australia
3. Mr Paul Fitzgerald Assistant Secretary, National e-Health Systems Branch, Australian Government Department of Health & Ageing

4. Mr Roger Glenny Health Insurance Commission
5. Mr Tony Hayes Director, Information and Business Management Branch, Queensland Health
6. Mr Garry Hulme Tasmanian Department of Health and Human Services
7. Mr Terry Lennard Director, Information Policy, Department of Health Western Australia (by telephone)
8. Mr Robin Michael Executive Director, Corporate Resources, South Australian Department of Human Services
9. Mr Stephen Moo Acting Director, Strategic Information Services, Department of Health and Community Services. Northern Territory Government
10. Mr Owen Smalley Chief Information Officer, ACT Health
11. Mr David Rowlands Director, National InfoStructure Development, Australian Government Department of Health and Ageing
12. Ms Jozefa Sobski Chief Information Officer, NSW Health

Also in attendance: Mr Adrian Beekmeijer, Dr Geoff Miller, Dr Christopher Mount, Mr Tam Shepherd, Ms Anthea Apps (all from National eHealth Systems Branch, Australian Government Department of Health and Ageing).

C.3 HealthConnect Stakeholder Reference Group (SRG)

1. Ms Yvonne Allinson Executive Director, The Society of Hospital Pharmacists of Australia
2. Mr Mark Brommeyer Principal Adviser, Chronic Disease and Information Management, Australian Divisions of General Practice
3. Ms Mary Collins National Prescribing Service Coordinator, The Pharmaceutical Society of Australia
4. Dr Moya Conrick Lecturer in Nursing, Griffith University. Representative of Royal College of Nursing and ANF on HealthConnect Stakeholder Reference Group.
5. Ms Robyn Cross Director, Speech Pathology Department, ACT Community Care, Health Professions Council of Australia
6. Ms Jan Donovan Consumer representative, Consumers' Health Forum
7. Mr Roger Glenny Health Insurance Commission

- | | | |
|-----|-------------------|---|
| 8. | Prof Michael Legg | Principal, Michael Legg & Associates, Australian Association of Pathology Practices |
| 9. | Ms Prue Power | National Director, Australian Healthcare Association |
| 10. | Mr John Feley | Health e-Business, Department of Veterans' Affairs |
| 11. | Ms Judith Skinner | President, COTA, Queensland, Council on the Ageing |
| 12. | Dr Michael Tooth | General Practice Computing Group |
| 13. | Dr Bob Webb | Anaesthetist, Townsville Hospital. Representative of North Queensland HealthConnect Trial |

C.4 Documentation and References

1. HealthConnect Program Office, HealthConnect Systems Architecture, version 0.9, September 2003.
2. HealthConnect Program Office, HealthConnect Architecture Overview, version 0.9, September 2003.
3. HealthConnect Program Office, HealthConnect Implementation Strategy, version 0.9, September 2003.
4. HealthConnect Program Office, HealthConnect Business Architecture, version 1.0, [dated] April 2003, [published] August 2003.
5. HealthConnect Program Office, Feedback Form, September 2003 [file rf2.pdf on HealthConnect website].

APPENDIX D - TERMS OF REFERENCE FOR DH4 REVIEW

1. Compile and analyse the formal responses to the HealthConnect systems architecture.
2. Suggest options for engagement with stakeholders and healthcare agencies who have not submitted formal responses.
3. Liaise with HealthConnect Design Section staff and the systems architecture consultants about the respondents' issues.
4. Make recommendations of activities that would finalise the systems architecture consultation process.
5. Prepare a briefing paper on findings, suitable for presentation to the Stakeholder Reference Group (SRG) and HealthConnect Board.
6. Prepare a detailed report including but not limited to:
 - (a) the issues and proposed resolutions provided in the responses;
 - (b) the area of development most suited to addressing the issues raised (i.e. some comments may relate to other areas of work outside of the systems architecture development);
 - (c) suitable methods of engaging stakeholders and healthcare agencies who have not submitted formal responses;
 - (d) advice on the ways to progress the issues raised in general comments and other specific comments sections of the response form and other documentation submitted as responses;
 - (e) the number of issues raised in each of the Response Form questions;
 - (f) the number of responses in agreement with each of the Response Form questions;
 - (g) list of health sectors and other community groups who have responded, as appropriate;
7. Attendance at the SRG meeting, scheduled for 24 February 2004 in Canberra, only for the agenda item concerning the participants' responses to the draft Systems Architecture.

The terms of reference were subsequently varied to include attendance and presentation at the HealthConnect Board on 10 March, assimilation of comments from both the SRG and the HealthConnect Board into the overall analysis, the production of a digest of responses as a separate document (for internal HealthConnect project team use) and the production of additional versions of this report to include later responses.

APPENDIX E – Analysis of Responses to Particular Issues

E.1 Response Statistics

Question/Issue	Active Resp	For	Partly For	Against	Partly Against	Unde cided	Balance +/-%	Uncert -ainty
1. HCx to operate as passive store	14	12	1	0	1	0	84%	9%
2. Data extensibility paradigm	15	11	2	0	2	0	68%	19%
3. Ability to support data extensibility	13	0	5	2	2	4	-6%	52%
4. Federation paradigm	18	9	3	1	3	2	48%	29%
5. Limiting the number of repositories	14	3	3	2	2	4	15%	41%
6. Constraining record to one repository	13	3	5	0	3	2	35%	45%
7. Vendor support for local front end	16	3	8	0	0	5	62%	53%
8 Supply info support optional functions	15	3	3	1	2	6	26%	55%
9. Provider systems deliver optional fns	14	4	7	0	0	3	66%	44%
10. Should HCx deliver optional fns	15	3	3	5	3	1	-17%	28%
11. Third party hosted storage	16	10	4	0	1	1	77%	21%
12. Support the three access methods	20	10	4	1	3	2	46%	32%
13. Three tier structure for HCx	15	6	3	1	0	5	57%	46%
14. Realistic implementation strategy	17	4	7	0	3	3	33%	46%
15. Support system/project development	16	10	4	0	1	1	63%	27%
16. Reference implementation	14	8	5	0	0	1	72%	25%

Note:

Refer to notes on page after next for details of how the arbitrary indicators for “balance of opinion” and “uncertainty” were calculated.

E.2 Response Profile

Response	q.01	q.02	q.03	q.04	q.05	q.06	q.07	q.08	q.09	q.10	q.11	q.12	q.13	q.14	q.15	q.16
01	yc	yy	znc	yq	qc	yc	yc	nq	yy	nq	yq	rr	yy	yq	yy	yq
02	zz	zz	zz	zz	zz	zz	zz	yq	yq	yy	yq	yy	qq	zz	zz	zz
03	yy	yy	qc	yq	yq	yy	yq	zz	qc	yc	yq	yy	znc	yq	yy	znc
04	yc	yc	yq	nq	yq	qc	qc	qq	rr	yq	yc	yy	znc	qc	qc	yq
05	nq	yc	nc	nc	yc	zz	yq	qq	yq	nc	nq	yc	nc	nq	nq	yq
06	yc	yc	yq	yc	nq	qc	yq	qq	yq	nq	yc	yy	qq	yq	yy	yq
07	yc	nq	rr	qq	yc	yc	qc	rr	yc	nq	yc	yq	yq	zz	yc	yc
08	yc	yc	yq	yc	nc	nq	yq	yc	yq	nc	yc	yq	yq	yy	yq	yc
09	yc	yc	nq	yc	qc	yq	qq	nc	zz	qc	yc	yq	qc	nq	yq	qc
10	yq	yc	yq	yc	nc	nq	yq	rr	yq	nc	yc	yy	qq	yq	yy	yq
11	yc	yy	nq	yy	yq	yq	yy	yy	qc	yy	yq	yy	yy	yy	yy	yy
12	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2
13	zz	yy	zz	yc	zz	zz	zz	zz	zz	zz	zz	yc	zz	zz	zz	zz
14	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
15	yc	yc	qc	yc	qc	yq	qc	yq	yq	yq	yc	yq	yq	yq	yq	yc
16	zz	zz	zz	zz	zz	zz	qc	zz	zz	zz	zz	nq	zz	nq	zz	zz
17	yc	yq	qc	qc	nq	yq	yq	qc	yc	nc	yc	nc	yc	qc	yc	zz
18	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2	z2
19	zz	zz	zz	nq	zz	zz	zz	nq	zz	zz	zz	nq	qc	qc	zz	zz
20	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
21	yc	nq	nc	nq	qc	nq	yq	yc	yq	yq	yc	nq	yy	yq	yc	yc
22	zz	zz	zz	yq	zz	zz	zz	zz	zz	zz	zz	qc	zz	zz	zz	zz
23	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
24	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
25	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
26	yc	yq	yq	yc	yc	yq	yq	yq	yc	nc	qc	yc	yc	yq	yc	yc
27	zz	zz	zz	yy	zz	zz	yc	zz	zz	zz	yc	yc	yy	yc	yq	yc
28	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz
29	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	yc	yc	yc
30	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz	zz

Response Statistics	q.01	q.02	q.03	q.04	q.05	q.06	q.07	q.08	q.09	q.10	q.11	q.12	q.13	q.14	q.15	q.16
Active:	14	15	13	18	14	13	16	15	14	15	16	20	15	17	16	14
For:	12	11	0	9	3	3	3	3	4	3	10	10	6	4	10	8
Partly For:	1	2	5	3	3	5	8	3	7	3	4	4	3	7	4	5
Against:	0	0	2	1	2	0	0	1	0	5	0	1	1	0	0	0
Partly Against:	1	2	2	3	2	3	0	2	0	3	1	3	0	3	1	0
Undecided:	0	0	4	2	4	2	5	6	3	1	1	2	5	3	1	1
Balance:	84%	68%	-6%	48%	15%	35%	62%	26%	66%	-17%	77%	46%	57%	33%	63%	72%
Uncertainty:	9%	19%	52%	29%	41%	45%	53%	55%	44%	28%	21%	32%	46%	46%	27%	25%

Note: Meaning of codes used and means of calculating statistics:

1. An “active” response is one in which the respondent has provided a specific response to a question (or has made other comments deemed relevant to the issue) and excludes missing entries or entries where the respondent was ‘unable to respond’.
2. “Balance” is calculated by producing a weighted proportion over all decided responses (ie. omitting undecided responses) with weights:- yc (5), yy (4), yq (2.5), no (-5), nc (-5) and nq (-2.5). While the possible range is theoretically from -100% to +100%, given the generally confirmatory nature of the questions asked, any negative or low positive % is interpreted as a significant indicator of an issue needing further consideration.
3. The uncertainty is an arbitrary indicator ranging from 0 to 100%, depending on the extent to which the respondents gave qualified or unsure answers. It is calculated as a weighted proportion of all active responses assigning weights:- yc (0), yy (1), yq (2.5), qc (4), qq (5), rr (4.5), no (0), nc (0) and nq (2.5).
4. In classifying and analysing the comments and answers received in response to specific questions raised in the Response Form, the following coding scheme was adopted:
 - [yy] ‘Yes’ (generally unqualified but sometimes suggesting only weak engagement with the issue being put forward).
 - [yc] ‘Yes’ with additional comment (usually indicating engagement with the issue).
 - [yq] ‘Qualified yes’ – moving toward assent but definitely less than full assent with the proposition being made.
 - [qc] A ‘qualified comment’ often expressing uncertainty or disengagement with the proposition but without significant support or rejection of the proposition.
 - [rr] A comment whose relevance as a response to the original question could not be readily ascertained.
 - [qq] A respondent query or response indicating insufficient information.

- [nq] 'Qualified no' – moving toward rejection but definitely less than full rejection of the proposition being made.
- [nc] 'No' with additional comment (usually indicating engagement with the issue).
- [no] 'No' (unqualified).
- [zz] No answer available.
- [z2] Answered by others associated with this respondent.
- [znc] Respondent commented to the effect that they were 'Unable to respond'.