



Victorian
Agency for
**Health
Information**

Health Data Integrity Program plan

2018–19 to 2019–20

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Summary

This plan supports the transition of the Health Data Integrity Program from an emphasis on random reviews (or audits) designed to achieve statewide estimates of overall accuracy, to a more targeted approach based on data analytics and risk assessment. Targeting higher risk issues will result in more efficient use of VAHI and health service resources to address issues across the system.

This Health Data Integrity (HDI) Program plan sets out the Victorian Agency for Health Information's (VAHI) initiatives and objectives for the next two financial years. In formulating its plans, VAHI considered the requirements of the Department of Health and Human Services (the Department), learnings from previous audits, and strategy development work undertaken by contractors for VAHI including strengths, weaknesses, opportunities and threats in relation to health data integrity in Victoria.

Purpose

The purpose of the HDI Program is to ensure that health data collections accurately reflect the care that was provided to patients. We monitor and support improvement in health data integrity for the benefit of health services and those responsible for:

- **oversight of health services** – including the Minister, the Department, Safer Care Victoria, health service boards and chief executives, and regulatory bodies
- **transparency and accountability of health services** – including the Minister, the Department, Department of Treasury and Finance, the Commonwealth Government and its agencies
- **stimulating improvements in patient quality, safety and outcomes** – including Safer Care Victoria and its clinical networks, the Victorian Clinical Council, clinical leaders and researchers.

Objectives

Our vision is that the community is better informed about health services and health services receive better information to serve their communities to provide better, safer care. Across our system everyone has an accurate picture of where the concerns are and where we're getting it right.

The strategic objectives of the HDI Program will contribute to health data integrity in Victoria's core health data collections and increase confidence in the accuracy of health services' data by:

- monitoring, reporting on and strengthening internal controls used in health services
- monitoring, detecting, reporting on and mitigating the risks and consequences of inaccurate health data
- providing stakeholders with an accurate picture of the strengths, weaknesses and threats related to health data integrity and recommending opportunities to improve it.

Scope

The HDI Program covers the same core health data collections that were previously the subject of regular review:

- Victorian Admitted Episode Dataset (VAED)
- Victorian Emergency Minimum Dataset (VEMD)
- Elective Surgery Information Systems (ESIS)
- Victorian Integrated Non-Admitted Health (VINAH) Dataset – Specialist Clinics
- Victorian Costs Data Collection (VCDC)
- Admitted Subacute Care data.

The program may be expanded in the future based on stakeholder priorities and analytics.

Key principles and components of the plan

Six key principles provide the foundation for the HDI Program:

- a strong emphasis on the assessment of risk and materiality
- maximising cost-effectiveness
- increasing resourcing agility
- concentration on data integrity issues using a multi-pronged approach
- if commissioned, ensuring audits adhere to auditing standards
- maximising impact of health data integrity activities.

Transition to the new program, with a re-designed approach to audits supported by data analytics, will occur from July 2018.

Key components of the new program include:

- a structured approach to identifying health data integrity risks including a planned data integrity analytics program, third party referral of issues and outcomes of prior audits
- targeted investigations (including audits) of areas of high risk

- targeted process and data entry reviews at health services
- random process and data entry reviews at health services
- monitoring of implementation of recommendations including requests for progress reports from health services, which include evidence of rectification or mitigation for high risk recommendations.

Data analysis activities will be performed on both a scheduled (generally quarterly) and ad-hoc basis and will focus on issues such as anomalies or consistent patterns in reported data and emerging trends. Analysis will be used to establish performance benchmarks and identification of outliers.

HDI investigations, audits, and process and data entry reviews will be undertaken by VAHI contractors. They will visit health services to review and report on health service data governance and oversight, data management, and data entry processes.

Health services will be advised of their inclusion in the targeted or random process and data entry reviews work program. However, due to their nature, limited notice of targeted investigations (including audits) will be provided to health services.

The HDI Program also incorporates monitoring of corrective actions and post-implementation reviews by VAHI.

Updated *Data integrity guidelines for health services* will be issued with this plan. As the program matures, VAHI will establish further education and training materials for individuals working in health services.

A review of the HDI Program will take place in the fourth quarter of the 2019–20 financial year (see ‘Benefits and evaluation’ section on page 19).

Introduction

This HDI Program plan sets out VAHI's initiatives and objectives for the next two financial years. In formulating this plan, VAHI reflected on the requirements of the Department of Health and Human Services (the Department) and learnings from previous HDI Programs. It also considered feedback from stakeholders in the Policy and Planning, and Commissioning, Performance and Regulation branches of the Department and health services.

Strategy development work undertaken by contractors for VAHI was also a key contributor and included analysis of strengths, weaknesses, opportunities and threats in relation to health data integrity in Victoria.

Health data integrity and Victoria's program

VAHI has adopted the World Health Organization definition of data integrity:

'Data integrity is the degree to which data are complete, consistent, accurate, trustworthy and reliable and that these characteristics of the data are maintained throughout the data life cycle. The data should be collected and maintained in a secure manner, such that they are attributable, legible, contemporaneously recorded, original or a true copy and accurate. Assuring data integrity requires appropriate quality and risk management systems, including adherence to sound scientific principles and good documentation practices.'¹

Quality data is a key asset which drives evidence-based decision-making. Health data is used to ensure and stimulate quality and safety improvements, increase transparency and accountability and inform the community.

Each day clinicians use health data to manage, monitor and improve clinical care and many stakeholders use these data to plan future services and conduct research. The Victorian and Commonwealth governments and their agencies use health data to set prices, benchmark performance and allocate funds, and it is a condition of funding that Victorian health services provide accurate and timely health data.

Over the last three years, the HDI Program reviewed all health services that reported to the Victorian Admitted Episodes Dataset (VAED), the Victorian Emergency Minimum Dataset (VEMD) and the Elective Surgery Information System (ESIS) at least once. Approximately half of the health services providing data to the Victorian Cost Data Collection and the Victorian Non-Admitted Health (Specialist Clinics) dataset were also reviewed by the program. These reviews focused on assessments of internal controls, together with a reconciliation of reported data to health service individual patient records.

Need for change

Historically, the program was intended to provide assurance that the data reported by health services was 'fit for purpose' in the context of funding and performance reporting. Until recently, there was insufficient reporting on quality and safety in Victoria using health data, as observed in *Targeting zero: Supporting the Victorian hospital system to eliminate avoidable harm and strengthen quality of care*.² In 2017, this situation changed rapidly with the establishment of VAHI and Safer Care Victoria.

The *Targeting zero* report emphasised that high quality data is crucial to supporting improvements in quality and safety. The HDI Program is an important element of VAHI's approach to data quality improvement and provision of assurance about the reliability and integrity of reported data. At the same time, the Council of Australian Governments has agreed to a new approach to funding for quality and safety. This approach will increasingly rely on the completeness and accuracy of diagnostic and procedure data from the VAED.

Historically, the HDI Program monitored implementation of recommendations from each health service review. From January 2017, in response to a recommendation of the Victorian Auditor-General's Office (VAGO) audit into *Efficiency and effectiveness of hospital services*³ in October 2016, the program required health services to provide evidence of implementation of review recommendations.

In October 2016 the HDI Program was also the subject of a Departmental internal audit. The key recommendation from that process was to establish a formal framework for the HDI Program that clearly defines governance and oversight mechanisms, roles and responsibilities (including a Responsibilities and Accountability Matrix), monitoring controls and program performance measurement and reporting.

Other recommendations concerned the establishment of an escalation and resolution framework for issues identified from the program, the establishment of Data Quality

Statements for key health datasets, and the updating of the *Data integrity guidelines for health services*.

Health service records have been sampled to support the creation of state-level estimates that enabled the monitoring of the accuracy of health data in the VAED across time. This random sample approach was designed for state-level estimates and was not designed to detect the shifts in coding practices.

In addition, previous HDI Programs were not designed to detect or screen for practices related to unreported data that should be reported. An example is the coding of aesthetic procedures to an obsolete elective surgery waiting list principal procedure code, as identified in December 2016. In response, the program undertook rapid inspections at health services and published the results and recommendations in *Elective surgery waiting lists: A rapid review to ensure full transparency*.⁴

The new HDI Program will conduct work to monitor and respond to shifts in coding practice and anomalies or consistent patterns in reported data and other emerging trends that are material in relation to funding services and reporting on quality and safety.

VAHI recognises the trust that stakeholders place in our work to monitor and improve health data integrity, and independently report accurate information on health service performance to strengthen oversight, improve transparency and accountability and drive improvements in quality, safety and outcomes. This program plan is intended to reinvigorate the HDI Program in light of these developments and to respond to the expectations of our stakeholders.

The plan supports the transition of the HDI Program from an emphasis on random reviews (or audits) designed to achieve statewide estimates of overall accuracy, to a more targeted approach based on data analytics and risk assessment. Targeting higher risk issues will result in more efficient use of VAHI and health services resources to address issues across the system.

Program plan

This program plan is made up of three strategic objectives (below) with clear outcomes for each that will guide our work from 2018 to 2020 in ways that align with VAHI's vision, mission and values. Our work will be informed by a program steering committee and we will manage risk through good governance as outlined on page 12.

Purpose

The purpose of the HDI Program is to ensure that health data collections accurately reflect the care provided to patients. The collections are used to stimulate quality and safety improvement, fund health services, increase transparency and accountability and inform the community accurately.

We will work collaboratively with health services to monitor and improve health data integrity for the benefit of those responsible for:

- **oversight of health services** – including the Minister, the Department, Safer Care Victoria, health service boards and chief executives, and regulatory bodies
- **transparency and accountability of health services** – including the Minister, the Department, Department of Treasury and Finance, the Commonwealth Government and its agencies
- **stimulating improvements in patient safety, quality and outcomes** – including Safer Care Victoria and its clinical networks, the Victorian Clinical Council, clinical leaders and researchers.

VAHI's vision is that the community is better informed about health services, and health services receive better information to serve their communities to provide better, safer care. Across our system everyone has an accurate picture of where the concerns are and where we're getting it right.

Objectives

The strategic objectives of the HDI Program are to contribute to health data integrity in Victoria's core health data collections and increase confidence in the accuracy of health services' data by:

- monitoring, reporting on and strengthening internal controls used in health services
- monitoring, detecting, reporting on and mitigating the risks and consequences of inaccurate health data
- providing stakeholders with an accurate picture of the strengths, weaknesses and threats related to health data integrity and recommending opportunities to improve it.

Scope

The HDI Program covers the same core health data collections that were previously the subject of regular review:

- Victorian Admitted Episode Dataset (VAED)
- Victorian Emergency Minimum Dataset (VEMD)
- Elective Surgery Information Systems (ESIS)
- Victorian Integrated Non-Admitted Health (MINAH) Dataset – Specialist Clinics
- Victorian Costs Data Collection (VCDC)
- Admitted Subacute Care data.

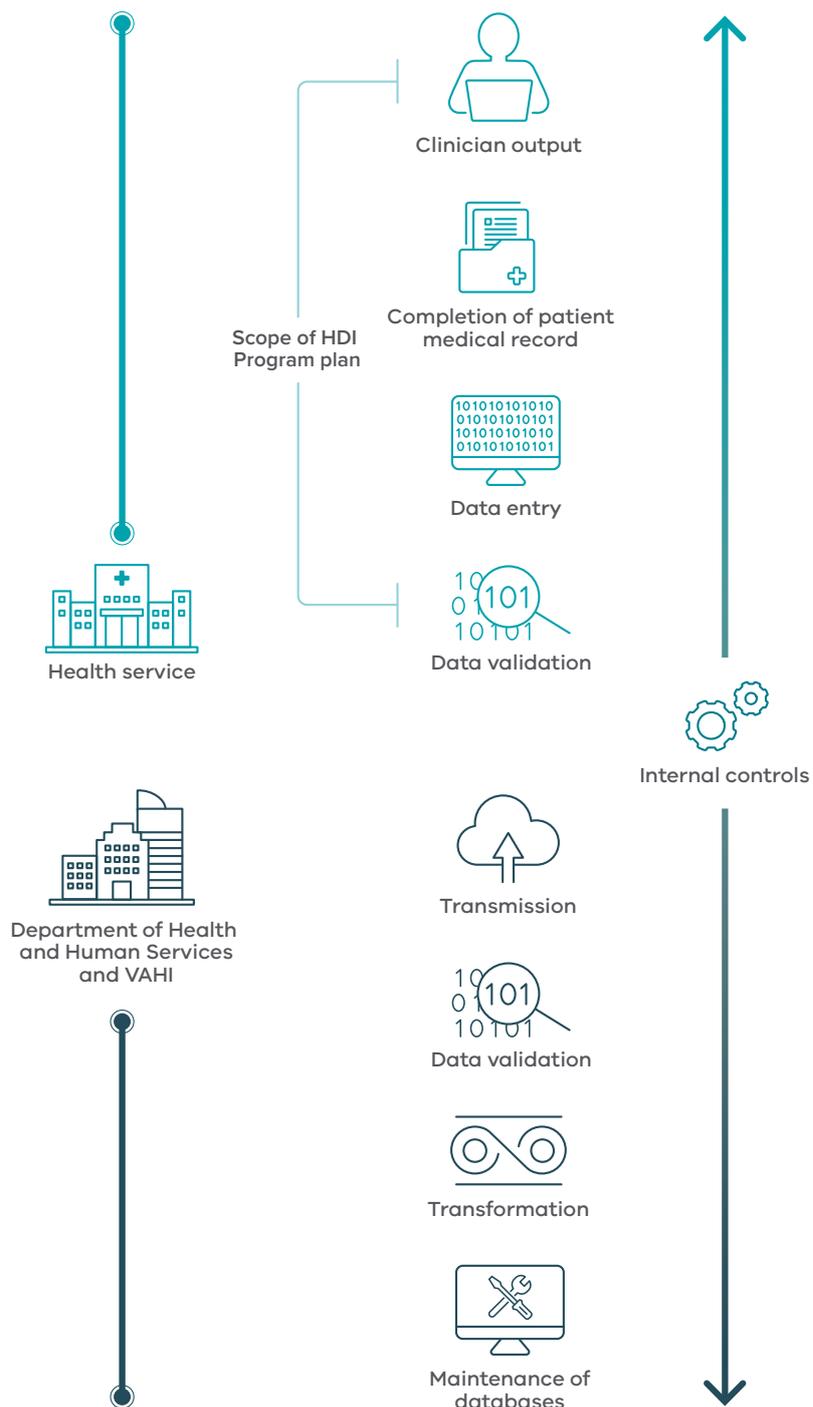
The program may be expanded in the future based on stakeholder priorities and analytics.

This program covers the first four steps of the data integrity process, shown in Figure 1 below, performed by health services: clinician input, completion of the patient medical record, data entry and data validation. It does not cover the remaining steps in the data integrity process,

which involve the Department receiving the data, performing data quality checks, transforming selected data items, and constructing and maintaining the consolidated databases.

The methods for assuring quality in translating data into performance measures are beyond the scope of the HDI Program, although it is part of the broader VAHI remit.

Figure 1: Data quality continuum



Key principles

Six key principles provide the foundation for this program plan:

- 1. A strong emphasis on the assessment of risk and materiality** by identifying and rating data integrity issues. A risk-based approach provides greater confidence that resources are targeted to the areas requiring the most management attention.

Risk and materiality assessment should also be used to determine the coverage and frequency of targeted initiatives such as reviews/investigations of data integrity practice. Findings from these initiatives should have an assigned risk rating and a clear rationale for this rating, based on the implications arising from the evidence. Recommended actions need to reflect the level of risk, and the response by health services needs to be commensurate with that risk.

- 2. Maximising cost-effectiveness** by only using specialised and external expertise when necessary. Investigations (including audits) require specialists and prolonged timeframes because of the in-depth analysis required. Under this program plan, investigations or audits are only triggered when serious issues or concerns are raised, and no other options are appropriate.

As the volume of data and reliance on it increases, it becomes increasingly important to make use of advanced technology and data analytics, in a cost-effective manner.

- 3. Increasing resourcing agility** to respond quickly to emergent data integrity issues. This principle supports the first two principles above. Issues will be identified by data analytics in contrast to current data integrity resourcing which is largely pre-determined.

- 4. Concentration on data integrity issues using a multi-pronged approach.** This differs from the previous data integrity program that at times simply examined compliance with Departmental policies, which while important, may have had little bearing on data integrity. The previous program also utilised one approach – principally audits – whereas this program plan exploits a range of tools to identify and address data integrity issues.

- 5. If commissioned, ensuring audits adhere to auditing standards** – refer to Appendix 1 for information on the appropriate auditing standard for health data integrity audits. This will result in findings and conclusions (including an assurance opinion) that can be relied upon by both the Department and health services.

- 6. Maximising impact of data integrity activities** by following up health services on identified data integrity issues and agreed corrective actions. Priority should be allocated to developing initiatives that improve data integrity practices across the health sector.

Governance and management

Implementation and operation of the HDI Program will be overseen by VAHI's Health Data Integrity Steering Committee, which is chaired by the Director, Information Infrastructure, Management and Standards (IIMS) and reports to the VAHI Executive Committee. Refer to Appendix 2 for the VAHI Governance Framework.

The Health Data Integrity Steering Committee's purpose is to support the HDI Program, raise and discuss any related issues or concerns and to work collaboratively to address these issues. Members will include VAHI, SCV and Departmental representatives.

Key functions of the Committee are to:

- advise on the proposed strategic approach for the HDI Program in the short term and the longer term to meet the broad VAHI objectives
- contribute to VAHI's understanding of concerns across the sector on health data integrity
- advise on operational aspects on the effective design, development, implementation, refinement and evaluation of the HDI Program as appropriate
- have oversight of, and monitor, procurement exercises (including contract extensions), proposed pilots or implementation plans
- support VAHI to effectively:
 - review and interpret audit findings, recommendations, health service responses and actions, and the outcome of data analytics to determine appropriate action
 - work with stakeholders to drive improvements in health data quality and integrity by: understanding barriers to compliance; and advising on issues to be addressed through effective policy, standards and activities with a focus on 'inform and educate' and 'support to comply'
 - identify HDI Program risks, and how these may be effectively mitigated.

NB: Because the Committee will regularly consider individual health service performance, health services will not be represented on the Committee for conflict of interest reasons. VAHI and the Department will utilise other settings and communication mechanisms to gain an overall industry perspective and seek specific input to operational issues, and to seek advice on and/or validate data analytics outcomes and interpret audit findings.

Roles and responsibilities of key stakeholders for main HDI activities are included in a Responsibilities and accountability matrix at Appendix 3.

Program implementation

The only data integrity activity at health services in 2017–18 was auditing of the 2016–17 VAED data using the traditional methods at a sample of 47 health service campuses. Transition to the new program, with a re-design approach to audits supported by data analytics, will occur in July 2018.

The VAED audits will continue over 2018–19 and 2019–20 and will include a targeted sample focused on data used to measure quality and safety. This targeted approach will include sample stratification to review the accuracy of coding of hospital-acquired complications (HACs) at health services.

The HDI Program will include audits of VEMD and ESIS datasets using a targeted risk based approach based on data analytics. The HDI program may also encompass review of other collections such Admitted Subacute Care, the Victorian Cost Data Collection and Specialist Clinics.

This approach needs to be flexible to accommodate unforeseen targeted audits or investigations that may arise, such as the Patient Waiting List Review conducted in 2017. VAHI will not engage in large scale contracts, but rather focus on engaging contractors on a smaller scale with shorter term engagements.

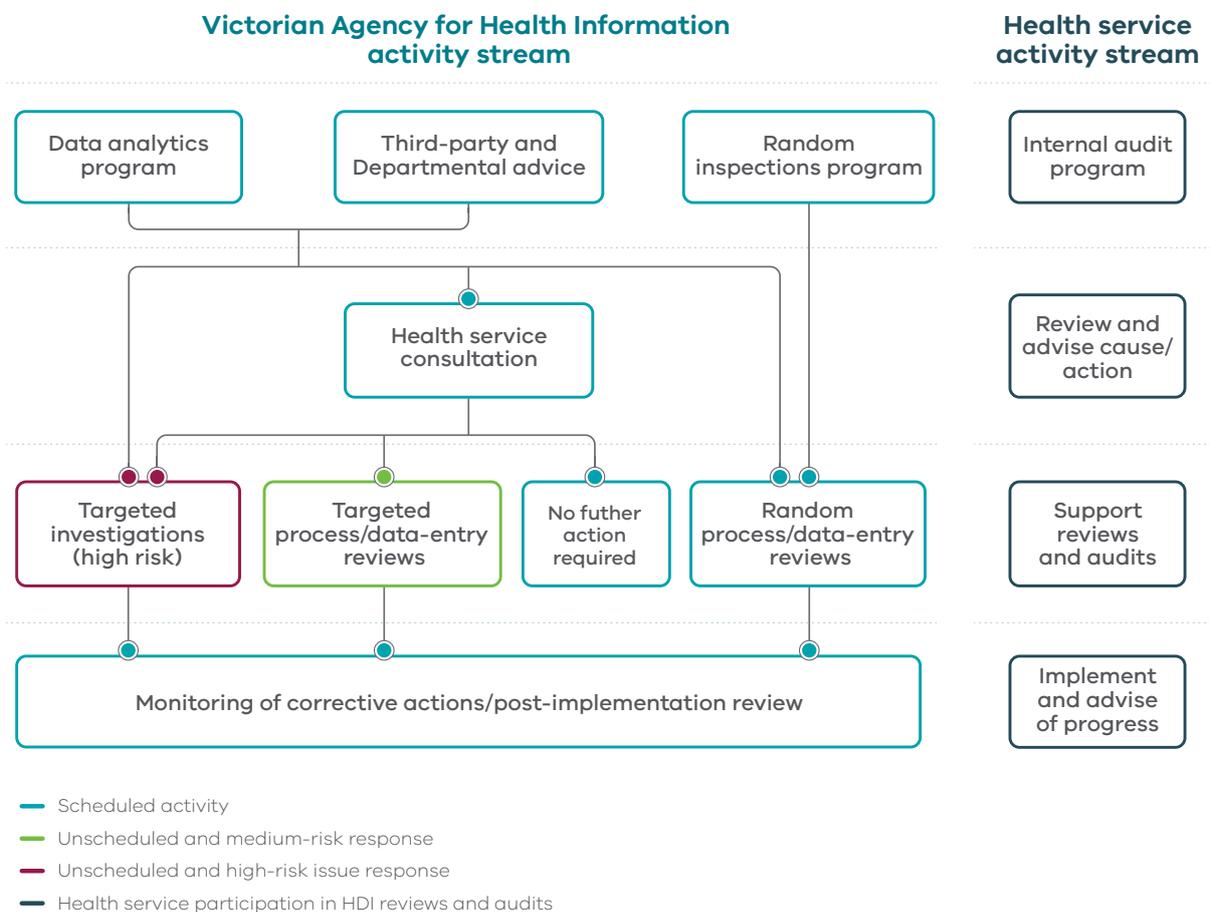
A review of the HDI Program will take place in the fourth quarter of the 2019–20 financial year (see 'Benefits and evaluation' section on page 19).

Elements of the program

The elements of the proposed HDI Program, shown in Figure 2 below and detailed on pages 14–16, have been designed to provide a range of options to satisfy the following requirements:

- Less emphasis on comprehensive dataset reviews. While the scale of the HDI program will largely be maintained, there will be an expansion of data analytics to support targeting of specific health services and fields, such as diagnosis or procedure codes. The Program will include targeting methods where high risk issues are identified.
- More rigorous assessment of existing and future methodological issues. Investigation and review methodologies adopted for each aspect of future programs are to be based on the data standards contained in data collection manuals and related reference material, the issues identified and the outcome sought.
- More rigorous follow up on investigation/review recommendations. Evidence of implementation may be sought through post-implementation reviews. This may include health service internal audits, where appropriate.
- Efficient use of resources. Future investigations and reviews will be tailored to utilise VAHI and health services resources more efficiently. Where appropriate, notice of planned reviews are to be provided to health services with significant notice to allow for coordination with health service internal audits.

Figure 2: Overview of the 2018-19 to 2019-20 Health Data Integrity Program



Updated *Data integrity guidelines for health services* will be issued with this plan. As the program matures, VAHI will establish further education and training materials for individuals working in health services. This will help them to become more aware of common threats to incomplete and inaccurate health data and in internal controls that can be used to mitigate risk to data integrity. The program may also provide health services with benchmarking for comparison purposes and health data integrity tools, such as templates to support their internal audit activities to strengthen health data integrity across the state.

Data analytics

Detailed data analysis of health services' reported unit record data will be undertaken by VAHI. The purpose of this ongoing activity is to provide VAHI with routine surveillance of datasets and key variables within datasets, to identify statewide or health service-specific issues requiring investigation through process and data entry reviews, and to support efforts to monitor corrective actions. The data analytics work will be informed by an HDI risk impact assessment completed by key stakeholders (see the template at Appendix 4). An example of an issue subject to a routine review may be rapid, short-term shifts in selected complication rates.

The data analytics program will also investigate third party referred data integrity issues where feasible, and will be complemented by analysis of the results of earlier HDI Program outcomes. Data analysis activities will be performed on both a scheduled (generally quarterly) and ad-hoc basis and will focus on issues such as anomalies or consistent patterns in reported data and emerging trends. Analysis will be used to establish performance benchmarks and identification of outliers.

Generally, where the results of VAHI's data analytics program indicate that some intervention may be necessary, VAHI will first discuss the outcomes of the analytical surveillance with the Department's Policy and Planning branch and Data Collections unit and then with senior representatives of the relevant health service(s) to ensure a shared understanding of the matters under review.

NB: VAHI will ensure that this consultative approach is coordinated across VAHI, the Department and SCV to avoid any duplication of effort and potentially unnecessary burden on health services.

Initially, health services will be consulted about medium and low risk issues identified in their health services through the program. The purpose of the consultation is to seek feedback and, where applicable, advice on the intended remediation or mitigation. Where medium and low risk issues are unresolved through consultation, they will be further assessed and considered for inclusion in the targeted process and data entry reviews.

This approach is designed to reduce VAHI and health services resources required for on-site visits. The outcome of the discussions is expected to resolve the issue and avoid further HDI Program intervention.

Where high risk issues are identified through the program, a targeted investigation (including an audit) may be commissioned. In this case, consultation with health services would form part of the investigation rather than prior to HDI Program intervention.

Third-party and Departmental advice

Referrals for targeted investigations and targeted and random process and data entry reviews may come from the Department, the Minister, health services themselves or from third parties.

Random inspections program

The HDI Program will continue to conduct periodic random reviews at health services, with scheduled visits to health services combining reviews of internal controls, oversight and governance with inspections of clinical coding accuracy and data recording and reporting practices. The random inspections program may be informed by data analytics or third-party and Departmental advice.

Targeted investigations

Targeted investigations will be conducted as a standalone exercise in response to identification of a specific, high risk issue at one or more health services, for example a rapid review of elective surgery waiting list practices conducted in 2017. These are expected to be infrequent arising from a referral from the Minister, the Department or potentially from health services themselves and will usually be informed by data analytics.

Investigations will be conducted on-site and are expected to be unscheduled with minimal advance notice. The timeframes, methods and dissemination of results, are subject to determination based on the nature of the issue and the source of referral.

Where it is considered appropriate to seek an assurance opinion over and above any findings of fact, an audit will be conducted in accordance with the Standard on Assurance Engagements ASAE 3500 Performance Engagements. Refer to Appendix 1 for more detail.

Process and data entry reviews

The HDI Program allows for both targeted and random process and data entry reviews.

Targeted process and data entry reviews will be indicated where specific issues have been identified through VAHI's data analytics program, in tandem with information and observations from VAHI and the Department's experiences using various health datasets.

These targeted reviews will assess the completeness and accuracy of nominated key variables within nominated health datasets. For example, if the prevalence of a complication for a select cohort shows a rapid increase across health services, patient records related to that cohort would be targeted to determine if it is a real quality and safety issue or a change in data entry practices. The key variables of interest may be identified based on the results of data analytics at the state, health service or campus level.

Random process and data entry reviews will be the result of random selection and will follow the same general approach as the targeted reviews. They will continue to provide a valuable educational opportunity to small health services with limited resources to conduct internal audits.

During a single visit to a health service, process and data entry reviews will largely follow the approach used in earlier programs. Auditors will assess a health service's internal controls, data governance and oversight to assess compliance with information management policy and with the *Data integrity guidelines for health services*. They may use random or targeted sampling of the most recent patient records to assess the completeness and accuracy of, for example, clinical coding or key date and time 'stamps'.

At the conclusion of the process and data entry review, a written report will be provided that contains findings and recommendations. There will be an opportunity for the health service to provide their response to the recommendations. Overall reviews or individual recommendations will be given a high, moderate or low risk rating.

These ratings have been developed from an analysis of results from recent years of the HDI Program. They are designed to provide guidance to the contractors and to inform the resultant corrective actions and appropriate timeframes. Refer to Appendix 5 'VAED impact assessment rating' and Appendix 6 – 'Risk rating guidance'.

Monitoring of corrective actions

There are two approaches to monitoring corrective actions where high and moderate risk findings are reported.

Where a high risk outcome arises, VAHI will request provision of specific evidence by health service chief executive officers (CEOs) that sufficient action has been taken to rectify or adequately mitigate the risk(s) identified. VAHI will use data analytics to monitor corrective actions implemented by health services and maintain communications with the health services' CEOs regarding findings.

In the case of moderate risk outcomes, VAHI will request that the health service CEO confirms that appropriate corrective action has been implemented.

No monitoring of health service's implementation of corrective actions will be conducted by VAHI in instances where a review (or investigation) has produced only low risk findings. VAHI will refer the follow-up to the health service CEO in these instances.

NB: Health service participation in the HDI Program and subsequent implementation of recommendations is a requirement of the annual Conditions of Funding. Health service boards of management are accountable for the accuracy of reported data. Boards are expected to make data integrity the responsibility of their audit committee and ensure that data accuracy is subject to appropriate controls, including regular internal audits.

Health services are required to:

- maintain board and board audit committee scrutiny of data integrity practices
- complete implementation of security improvements for elective surgery and emergency department information technology systems, including implementation of unique user identity and password controls, and routinely reviewing ICT system transaction logs

- implement recommendations from audits conducted at their health services
- provide a data quality attestation in the health service's annual report.

VAHI's Health Data Integrity Steering Committee will review and interpret findings and recommendations, health service responses and actions taken, and the outcome of data analytics to determine appropriate action (if required).

Post-implementation reviews

Post-implementation reviews involve on-site validation of implementation of recommendations associated with high risk/priority recommendations arising from reviews or investigations. These may be undertaken either by contractors or by VAHI staff, dependent upon complexity, sensitivity and capacity.

VAHI has a recommendation management database that supports monitoring of implementation of audit recommendations. Monitoring of corrective actions and post-implementation reviews, defined under this Program plan, will remain an important aspect of effective oversight of health data integrity.

NB: Under the new HDI Program plan, there is less emphasis on statewide results, therefore it is anticipated that there will be no public reporting of results of process and data entry reviews. Publication may be considered for targeted investigations.

Supporting activities/initiatives

Contractor skill sets

The majority of health data integrity work at health services will be undertaken by contractors on behalf of VAHI. Experience has shown that contractor staff often face a steep learning curve in achieving confident familiarity with the subject matter generally and the specifics of the task at hand, no matter how well defined in the engagement documentation.

Under the new HDI Program, engagement documentation will include specific guidance about the skills, knowledge and experience required by staff deployed by contractors to the work undertaken on behalf of VAHI. This is distinct from the skills, knowledge and experience the contractor is able to demonstrate on its own behalf. A draft of the contractor staff knowledge and experience specification is provided as Appendix 7.

Defining risk ratings

In earlier HDI Programs, contractors have been asked to apply risk, or priority, ratings of high, moderate/medium or low to findings and recommendations. Variations in the assessment of risk/priority between contractors have been noted, although it has to be acknowledged there are some issues with making comparisons across datasets.

As part of implementing the new HDI Program plan, VAHI has developed guidelines for allocating risk or priority ratings to achieve better comparability across reports of the various activities undertaken under the umbrella of the HDI Programs. The risk rating guidance documents, including examples of issues and evidentiary requirements to confirm implementation of recommendations, are provided as Appendices 5 and 6.

Relationship with health services' internal audits

In 2009, the Minister for Health instructed each health service board chair that data integrity was to be the responsibility of their audit committee. That instruction has not been rescinded. Thus health service internal audit programs are expected to include data integrity audits, with the results reported to the health service board.

With respect to scheduled process and data entry reviews, this program plan includes a commitment to provide reasonable advice to health services of scheduled inspections each year. This will mitigate the risk of duplication of effort between VAHI and health services' internal audit programs.

Health data integrity investigations and reviews will continue to use any relevant internal audit work that has been carried out at health services. This helps to lessen the effort required by health services, reduce the cost to VAHI, and achieve maximum benefit from work undertaken. For more information, please see the *Data integrity guidelines for health services*.

Data integrity guidelines for health services

VAHI has revised and re-released the *Data integrity guidelines for health services*. The document can be found at <https://bettersafecare.vic.gov.au/media/2321>. The guidelines will assist health services to improve internal controls, resulting in greater confidence in reported data.

Impacts on program development

The key changes included in the program development involve a departure from the practice of routine audits of all health services providing data to specific data collections. The program has a requirement for an enhanced data analytics capacity to assist in focusing VAHI's Health Data Integrity effort in data collection areas and health services where improvement opportunities are identified. This will support the development of a program of random process and data entry reviews designed to address issues identified through the data analytics process and through prior health data integrity activities.

Higher priority issues identified through the data analytics program will result in targeted investigations and/or targeted audits at health services, potentially involving targeted samples of patient records.

The development of the program plan has been influenced by recommendations from both internal and external audits and reviews. This includes recommendations from the Department's internal audit of the Data Integrity Framework and the recommendations from the October 2016 Victorian Auditor-General's Office (VAGO) performance audit of the *Efficiency and effectiveness of hospital services: emergency care*.³ The recommendations and responses are provided at Appendix 8.

While events have overtaken some of these recommendations, the intent of each of the recommendations has either been addressed or will be dealt with through the development and implementation of this program plan. In particular, the term 'Data Integrity Framework' has been updated to 'Health Data Integrity Program Plan'.

The HDI Program is not specifically addressed in the *Targeting zero* report that led to the establishment of VAHI. However, the commitment to high quality data emphasised in the report is supported by a re-focused, agile health data integrity work program.

The program will focus on the use of data already held by VAHI to identify the most effective use of Health Data Integrity resources in support of the improvement agenda of VAHI, Safer Care Victoria and the Department.

Benefits and evaluation

The HDI Program has always provided the following benefits:

- monitoring and supporting improvements in health data integrity, including governance structures and management oversight of data collection, recording, storage, extraction and submission practices
- recommending opportunities for improvement with respect to the accuracy and integrity of data
- encouraging internal auditing practices and compliance with relevant standards, policies and guidelines
- increasing confidence in the quality of performance and activity data
- supporting workforce development and training
- supporting clinical documentation improvements.

The enhanced program is designed to maximise these benefits through concentration on:

- increased focus on risk and materiality
- increased cost effectiveness and resource agility
- maximising the impact of data integrity activities.

A structured, independent evaluation of the HDI Program and the associated work program is to be undertaken two years after the completed program plan is adopted by VAHI in July 2018.

The evaluation process will include consultation with key stakeholders to obtain input and evidence to establish the degree to which the new program has maximised the impact of data integrity activities.

The evaluation report will indicate the changes to data integrity approaches and resourcing that are required to improve the quality, effectiveness and efficiency of the program.

The enhanced program will be evaluated against the following key performance indicators:

1. Increased focus on risk and materiality:

- number of separate data integrity issues examined
- number of data integrity issues that result in health service consultation
- number of data integrity issues that result in a review, audit or investigation
- increase in the number of health services involved in annual HDI activities.

2. Increased cost effectiveness and resource agility:

- amount of budget savings
- number of reviews avoided through satisfactory resolution of data analytics queries.

3. Maximising the impact of data integrity activities:

- proportion of health services that do not meet VAED audit pre-determined benchmarks
- number of high, medium and low risk findings identified that lead to improved internal controls
- proportion of high, medium and low risk recommendations being completed
- number of recommendations for VAHI and Department action that lead to improvements in practices/approaches/guidelines/education
- proportion of recommendations for VAHI and Department action that lead to improvements in practices/approaches/guidelines/education being completed.

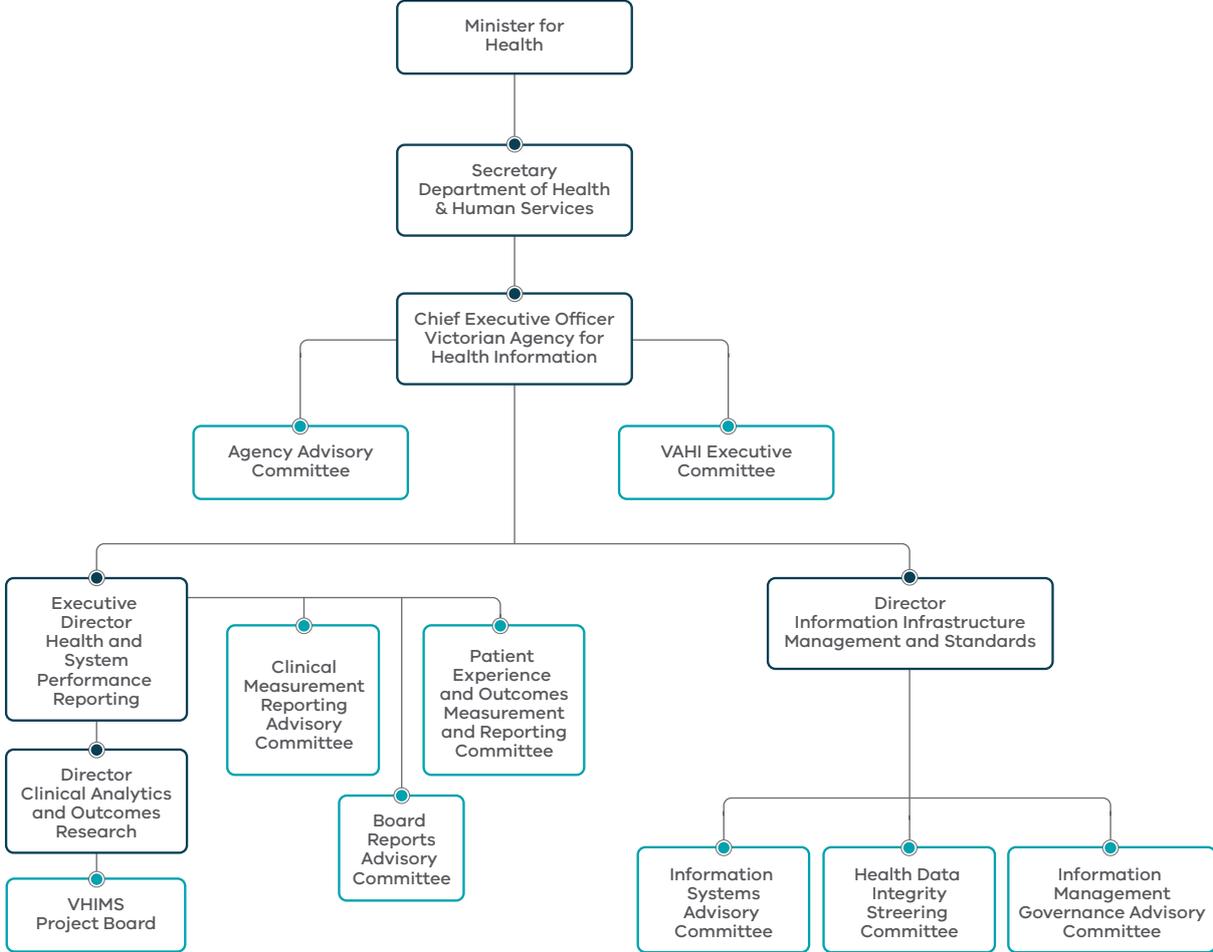
Appendix 1 – Summary of audit standard ASAE 3500

ASAE 3500 is a standard of the Australian Auditing and Assurance Standards Board (AUASB) for Performance Engagements. The full standard is available on the AUASB website. The following guidance has been condensed from the standard.

Key audit element	Requirements
Clear objectives	The objective defines what VAHI wants to achieve from the audit. The auditor must explicitly conclude against each objective.
Suitable criteria	Criteria are reasonable and acceptable standards of performance. Suitable criteria are relevant (able to contribute to conclusions), complete (no relevant factors omitted), reliable (consistent and sound), neutral (free from bias) and understandable (not subject to different interpretations). Criteria should be agreed by VAHI and auditors must explicitly address these criteria.
Sufficient and appropriate evidence	<p>ASAE 3500 requires appropriate and sufficient evidence to support all audit findings and conclusions. Although ASAE 3500 does not define how appropriateness – which covers relevance and reliability – and sufficiency are determined, evidence should be:</p> <ul style="list-style-type: none"> • relevant – the extent to which evidence contributes to, and is consistent with, reaching a finding and a conclusion against the objective • reliable – the extent to which evidence is based on a sound method • sufficient – the quantity of evidence required to reaching a finding and a conclusion against the objective.
Risk-rated findings	Findings are not specifically defined in ASAE 3500, but essentially represent the difference between the criteria (what should be in place) and evidence (what is in place). The auditor should assign a risk rating and underlying rationale for each finding.
Definitive conclusion	Based on professional judgment, the conclusion states the degree to which each audit objective was met and is supported by relevant findings and evidence. The rationale for each conclusion should be explicit in the audit report.
Clear recommendations	Recommendations are required actions arising from specific findings. Each finding must have a recommendation. The recommended actions must be assigned a risk rating commensurate with the finding.
Detailed work program	The contractor will be required to prepare a work program for VAHI's approval. The program will outline – under each objective and associated criteria – the timing and extent of evidence-gathering actions and who will be responsible for undertaking these actions.

Appendix 2 – VAHI Governance Framework

VAHI Governance Framework



Appendix 3 – Responsibilities and accountability matrix

The following table shows roles and responsibilities of key stakeholders for major activities of the HDI Program.

Role	HDI Management Team	Director IIMS	HDI Steering Committee	VAHI Executive Committee	Health services
Key activity					
Develop HDI Program plan	R	A	C	C	C/I
Identify issues for intervention*	R	A	R/C		R/C/I
Plan intervention	R	A	C		
Procure contractors	R	A	C		
Manage interventions	R	A	C		
Report results from interventions	R	A	C	I	C/I
Monitor corrective action	R	A	R/C	I	C
Evaluate HDI Program	R	A	R/C	C	C/I

Definitions: R = Responsible A = Accountable C = Consult I = Inform

* Interventions include process and data entry reviews, audits and investigations.

Appendix 4 – Health Data Integrity risk impact assessment questionnaire template

Health Data Integrity risk impact assessment questionnaire*

Data collection name:

Instructions: Please score the following questions and include any comments (if applicable)

#	Question	Assessment	Comments	Assigned score
A	Decision impact To what degree would a lack of data integrity in this data collection lead to the inability of management to make informed strategic and operational decisions?	3	The survival of the entity may be threatened due to management’s inability to make informed strategic and operational decisions	
		2	The entity may suffer significant financial loss (direct costs or lost opportunities) due to management’s inability to make strategic and operational decisions.	
		1	The entity may incur limited increased costs due to management inability to make some strategic and operational decisions.	
		0	No impact on the ability of management to make informed strategic and operational decisions.	
B	Reputation To what extent would a lack of data integrity in this data collection have a negative effect on the department’s reputation?	3	Sustained statewide and national media coverage and/or serious reputation impact.	
		2	Limited statewide or national media coverage and/or some reputation impact.	
		1	Limited local or industry media coverage and/or isolated reputation impact.	
		0	No media coverage. No reputation impact.	

* Adapted from: Department of Treasury and Finance. Victorian Public Service (VPS) Data integrity manual, Version 1.2. Melbourne: DTF; 2010.

#	Question	Assessment	Comments	Assigned score
C	Financial losses What level of financial loss would be incurred due to a lack of data integrity in this data collection?	3	Significant costs, which would materially affect the financial statements of the entity.	
		2	Significant costs, however there would be no material impact on the financial statements of the entity.	
		1	Some increased (but not significant) costs.	
		0	No financial impact.	
D	Stakeholder expectations What impact would a lack of data integrity in this data collection have on stakeholder relationships?	3	Major impact on stakeholder relationships and irreparable harm to the image of the entity.	
		2	Dissatisfaction amongst many stakeholders and the potential for a moderate impact on stakeholder relationships.	
		1	Some dissatisfied stakeholders with the potential for some impact on stakeholder relationships.	
		0	No impact on stakeholder relationships and the image of the entity.	
E	Legal impact What legal impacts would result from a lack of data integrity in this data collection?	3	Legal action may result that would threaten the ongoing survival of the entity.	
		2	Significant legal action may result that would have a large impact on the entity.	
		1	Minor legal action may result which would have little impact on the entity.	
		0	No legal impact.	

#	Question	Assessment	Comments	Assigned score
F	Legislative context To what extent would a lack of data integrity in this data collection have an impact on legislative decisions or objectives?	3	There would be a direct and significant adverse impact on major legislative decisions or objectives.	
		2	There would be a direct and significant impact on minor legislative decisions or objectives, or a direct but small impact on major legislative decisions or objectives.	
		1	There would be a direct but small impact on minor legislative decisions or objectives.	
		0	No impact on any legislative decisions or objectives.	
G	Perverse Incentives What level of incentive exists to encourage manipulation/falsification of data to gain advantage?	3	Health services stand to gain financial and/or favourable performance benefits.	
		2	Policy safeguards exist to reduce the risk of manipulation/falsification.	
		1	The data are of limited financial or performance impact.	
		0	No incentive.	
H	Other To what extent is this data collection impacted by other factors relevant to the entity's industry or sector?	3	The data is extremely important for the entity's industry/sector and any data integrity issues would have a significant impact on the entity.	
		2	The data is relatively important for the entity's industry/sector and any data integrity issues would have a moderate impact on the entity.	
		1	The data is not that important for the entity's industry/sector but any data integrity issues would have a moderate impact on the entity.	
		0	The data is not important for the entity's industry/sector.	
			Highest score	

Classification of importance

Determine the highest (individual) score based on the questionnaire and use the table below to determine the classification of importance for the key data dependency.

For example, if the highest individual score assigned to any of the seven questions was 3, then the classification of importance is 'High' – regardless of the scores assigned to other questions. If the highest individual score for any of the questions was 2, then the classification of importance is 'Moderate' etc.

Classification	High	Moderate	Low	Not required
Highest score	3	2	1	0

Appendix 5 – VAED impact assessment rating

The aim of the impact rating is to provide an assessment of the potential adverse impact the issues identified in the audit represent, with respect to:

- overall integrity of health service data compared to Victorian audit outcome benchmarks
- overall integrity of the data for funding model development purposes
- overall integrity of the data for monitoring of patient safety and quality outcomes.

The assessment represents the potential impact that could arise from the following quantifiable indicators:

- Audit results indicate significant rates of changes in DRGs and/or WIES.
- Audit results indicate significant error in the assignment of prefixes to diagnosis codes.
- Audit results indicate significant errors in the application of Criteria for Admission.

The assessment can also be impacted by the following factors:

- Audit results indicate that potential exists for significant WIES impact, not reflected in the audit sample results.
- The audit identified systemic issues associated with management decisions to implement/apply a practice that is not consistent with instructions issued by VAHI.

The following table describes the criteria that contribute to determination of the impact assessment rating.

Rating assessment	Interpretation	Basis for rating*
High impact	<p>Audit results show a level of data error that represents a material impact on either or all of the organisation's financial performance, the reputation of the organisation and on the fitness for purpose of the data.</p> <p>High impact ratings require immediate remediation and are to be subject to reporting by the Chief Executive Officer of the health service.</p>	<p>Audit results fail one or more of the following:</p> <ul style="list-style-type: none"> • The estimate for net WIES change is greater than +/- 0.5%² (casemix funded) or +/- 1.0% (block funded). • The estimate for gross WIES change is greater than 5%. • The rate of DRG change is greater than 7%[†] (casemix funded) or 10% (block funded). • The rate of prefixing errors is greater than 8%. • Episodes failing CFA is greater than 2%. • A systemic issue has been identified that could materially impact the integrity of the data used to support funding and other departmental policies.
Moderate impact	<p>Audit results show a level of data error that could adversely impact either or all of the organisation's financial performance, the reputation of the organisation and on the fitness for purpose of the data.</p> <p>Moderate impact ratings require remediation as soon as practicable (certainly within 6 months of the completion of the audit) and are to be reported upon by the Chief Executive Officer of the health service.</p>	<p>Audit results fail one or more of the following:</p> <ul style="list-style-type: none"> • The estimate for net WIES change is greater than +/- 0.3% (casemix funded) or +/- 0.7% (block funded). • The estimate for gross WIES change is greater than 2.5%. • The rate of DRG change is greater than 5.0% (casemix funded) or 7.5% (block funded). • The rate of prefixing errors is greater than 5.0%. • Episodes failing CFA is greater than 1.0%. • A systemic issue has been identified that could negatively impact on the integrity of the data used to support funding and other departmental policies.
Low impact	<p>The audit results indicate that the level and/or nature of data inaccuracy is unlikely to have an impact on the financial performance and reputation of the organisation.</p>	<p>All key audit indicators are within audit outcome benchmarks.</p> <p>None of the above criteria are met.</p>

* Impacts of higher rates of percentage change attributable to small sample sizes, or single sources of error may result in lower impact assessments than indicated by benchmarks.

[†] Exceeding this threshold is rated as high impact only if the change rate is also statistically significant (p<0.05). If not, then a moderate impact rating is applied.

Appendix 6 – Risk rating guidance

The following table shows the risk rating VAHI will provide to guide contractors undertaking health data integrity work (other than VAED audits).

Risk rating	Description
<p>High</p>	<p>A risk that can significantly compromise the health service’s internal control framework and/or operational efficiency. High potential to cause severe disruption to the business operations, reputation, or financial loss. Requires prompt executive management attention and introduction of control measures to mitigate the risk within the next 3 to 6 months with regular monitoring by the Audit & Risk Management Committee. Formal notification of progress with implementation is to be provided by the health service to the VAHI CEO by the health service chief executive.</p> <p>An example of a high risk rated recommendation is as follows:</p> <p>‘Stronger management oversight and formalised audit trail and exception reporting is required to support VEMD submission and error correction processes.’</p>
<p>Moderate</p>	<p>A risk that can undermine the system of the health service’s internal control and/or operational efficiency but not requiring immediate action. Some potential for a moderate adverse effect on the business operations, reputation and financial loss with the weakness representing a significant deficiency in the system. Remedial action by health service executive management is required as soon as practicable, and within the next 6 to 12 months. Formal notification of progress with implementation is to be provided to the VAHI CEO by the health service chief executive.</p> <p>An example of a moderate risk rated recommendation is as follows:</p> <p>‘Opportunities exist to enhance consistency of timestamp recording in line with DHHS requirements.’</p>
<p>Low</p>	<p>A risk that does not significantly detract from the health service’s internal control framework and/or operational efficiency and is mainly raised for management’s consideration only. Limited potential for an adverse effect on the business operations, reputation or financial loss with the weakness representing a minor deficiency in the system. Remediation is subject to the risk tolerance of the health service itself. An example of a low risk rated recommendation is as follows:</p> <p>‘Primary diagnosis code listing should be updated to be consistent with the current VEMD Library file.’</p>

Appendix 7 – Draft specification of contractor staff knowledge and experience

Both management and operational staff deployed by contractors to undertake health data integrity investigations and reviews on behalf of VAHI are required to possess the following knowledge and experience:

- Detailed understanding of the Victorian public health system and the key health datasets.
- Working knowledge of health data integrity issues and methods.
- Working knowledge of health service environments (information systems, practical application and key roles) specific to the dataset that is the subject of the engagement (e.g. emergency department, elective surgery waiting list).
- Clear understanding of relevant Department policies, guidelines and reporting requirements relevant to the key health datasets.

In addition, the contractor's staff require very effective written and verbal communication skills, including the ability to work effectively with executive, management, clinical and administrative staff of health services.

Contractors are expected to provide evidence of satisfactory results from a Victoria Police criminal record check for all staff deployed to work in health services as part of VAHI engagements.

Appendix 8 – VAGO and DHHS internal audit recommendations

The following table is taken from the Victorian Auditor-General’s Office and Department of Health and Human Services internal audit recommendations.

Source	Recommendation	Response
VAGO	The Department of Health and Human Services request evidence from health services to determine whether audit recommendations for the Victorian Emergency Minimum Dataset have been satisfactorily implemented	Accepted. The Department’s Health Data Integrity audit recommendations implementation procedures are being modified to require relevant and robust evidence from health services that demonstrates implementation of actions.
VAGO	That the Department of Health and Human Services maintain Victorian Emergency Minimum Dataset audit coverage for health services with identified weaknesses until there is a measurable improvement in identified weaknesses in data accuracy or recording practices	Accepted. The Department has recently completed an internal audit to evaluate processes and controls in respect to the collection and use of information for performance reporting and funding purposes. The Department will implement and strengthen processes to verify improvement in health services’ data accuracy and recording practices through improved governance and oversight of the data integrity audit program.
DHHS internal audit	Establish Data Quality Procedures over the management of key health datasets, incorporating the structure outlined in (a) above (to be owned by Data Stewards and Data Custodians).	Accepted. The Department will consider incorporating the structure outlined in (a) above into the existing DHHS Data Quality Standard Operating Procedures. The Procedures will be updated to reflect the data quality management methodology for the key health datasets collected by the Department.
DHHS internal audit	Establish Data Quality Statements for the key health datasets, in line with the requirements of the Department-wide Data Quality Framework (to be owned by Data Stewards and Data Custodians).	Accepted. The Department is in the process of establishing Data Quality Statements for the key health datasets. These are to be incorporated in the manuals for each dataset.

Source	Recommendation	Response
<p>DHHS internal audit</p>	<p>Update the Health Data Integrity Guidelines for Health Services, to incorporate the additional content outlined in (c) above, including the required data integrity controls expected of Health Services, and the related monitoring and assessment to be performed over the data integrity controls. The Health Data Integrity Guidelines for Health Services should support the Data Quality Procedures, and outline the Data Quality Dimensions referenced in the Department-wide Data Quality Framework, as well as the Data Quality Statements established for the key health datasets.</p>	<p>Accepted.</p> <p>The Department has commenced updating the Health Data Integrity guidelines for health services. The review will consider the additional content proposed and will include reference to the appropriate aspects of the DHHS Data Quality Framework.</p>
<p>DHHS internal audit</p>	<p>Establish a process to periodically review key policies and procedures. Where it is determined that policy should be updated, this should be completed in a timely manner and updates should be formally approved and communicated to the relevant stakeholders and staff.</p>	<p>Accepted.</p> <p>Key policies and procedures will continue to be reviewed when required, with an approach articulated in the development of a new Data Integrity Program Plan.</p> <p>Manuals for each of the key health datasets will continue to be annually reviewed and subject to formal approval processes.</p>
<p>DHHS internal audit</p>	<p>Ensure that appropriate levels of training and communication are undertaken in relation to the key policies and procedures pertinent to data integrity.</p>	<p>Accepted.</p> <p>The Department is in the process of re-instating and updating the Health Data Integrity webpage. The webpage will contain cross links to the key health dataset manuals and the updated Health Data Integrity Guidelines for Health Services document.</p> <p>The webpage will include links to other reference sites/materials e.g. the VPS Data Integrity Manual published by the Department of Treasury and Finance.</p>
<p>DHHS internal audit</p>	<p>Establish a formal framework for the Health Data Integrity Audit program that clearly defines governance and oversight mechanisms, roles and responsibilities (including a Responsibilities and accountability matrix) monitoring controls and program performance measurement and reporting.</p>	<p>Accepted.</p> <p>As an initial step, the Department will review exemplar Data Integrity Frameworks to identify better practice. This will inform development of a Health Data Integrity Program Plan for the Department.</p>

Source	Recommendation	Response
DHHS internal audit	Consistent with the management response provided to the ARMC to address Department-owned recommendations from the Health Data Integrity Audit program, the Department should establish an escalation and resolution framework for issues identified from the program.	Accepted. The Department, will consider the role of the Health Data Management Group in escalation and resolution of issues identified in the HDI Program
DHHS internal audit	The Department should consider the reporting lines of the Health Data Integrity Team as part of the formalisation of the governance and accountability framework for the Health Data Integrity Audit program.	Accepted. The Department will examine reporting lines in the context of broader governance and accountability arrangements across the Department, taking into account existing organisational reform initiatives.
DHHS internal audit	Clearly define the scope, objectives and business case of the Health Data Integrity Audit Program to enable measurement of success.	Accepted. The process of research and development of a Health Data Integrity Program Plan, and the next Health Data Integrity audit program, will involve documentation of the scope and objectives of the program.
DHHS internal audit	Formally document the benefits management framework that will be used to track and measure qualitative and quantitative benefits.	Accepted. The development of a Health Data Integrity Program Plan, and the next Health Data Integrity audit program, will include articulation and measurement of the qualitative and quantitative benefits of the Health Data Integrity ("HDI") program.
DHHS internal audit	Establish KPIs for future audit programs with a clear link to defined program objectives. From here, performance should be critically assessed against these KPIs on a regular basis (at least every 6 months) and reported to executive management.	Accepted. Key performance Indicators will be developed and socialised with internal stakeholders, in particular with respect to issues where dependencies upon stakeholders impact.
DHHS internal audit	Work with the audit providers and key stakeholders of the Program to periodically challenge the scope and approach to ensure that it provides appropriate coverage of risks. This process should include stakeholder workshops, as well as consideration of changing Statement of Priorities (SOPs), Departmental objectives, key themes identified from prior audits and periodic risk assessments over the data collections under examination.	Accepted. As part of the roll-out of a risk-based audit program under the proposed Health Data Integrity Program Plan, there will be regular opportunities built in for stakeholders to challenge the scope of, and approach to, the program. The Department supports the inclusion of recommended processes and information sources in this process. This practice will commence with the new program from March 2017.

Source	Recommendation	Response
DHHS internal audit	Formalise risk identification and assessment processes to be performed at the start of each Health Data Integrity Audit Program cycle. This should include an analysis of the associated with each datasets to prioritise and direct audit efforts appropriately.	Accepted. The Department has commenced design of a risk-based approach to the development of future audit programs. This will be regularly 'challenged' (refer section 2.3.4). Work that has commenced includes formal data integrity risk assessments of key health datasets using a slightly modified DTF template.
DHHS internal audit	The formalised risk identification and assessment processes should also incorporate consideration of key themes and findings from the previous audit program and how they are targeted by the proposed program to support the improvement of the data quality environments at health services.	Accepted. Key themes and findings from prior audits will be important inputs to the development of the Health Data Integrity work program proposal. management by the Department of health service audit findings and recommendations is reliant on a legacy database system involving 'work-arounds' to extract this level of information – refer section 2.5.1.
DHHS internal audit	Periodically evaluate the data elements subject to audit (as listed within the audit specification) and the scope of procedures being performed for each dataset to ensure that they sufficiently reflect evolving areas of risk within the datasets.	Accepted. Data element and audit scope reviews are already key inputs to the consideration of each new audit program. Refinements can also be made mid-program to reflect emerging areas of concern/ changed emphasis.
DHHS internal audit	Implement evidentiary requirements as part of the follow-up process of recommendations associated with high rated issues identified at Health Services.	Accepted. The Department's Health Data Integrity audit recommendation implementation procedures are being modified to require relevant and robust evidence from health services that demonstrates implementation of actions. In the medium term, this is anticipated to involve migration of the existing system from a desktop environment to a network platform.
DHHS internal audit	Strengthen reporting and analysis of significant aged open recommendations and those recurring findings identified at Health Services to assist Departmental stakeholder identification and escalation of key issues, as well as informing resource allocation decisions to assist health services remediate significant/systemic issues.	Accepted. In consultation with health services, the Department will enhance the monitoring and reporting of ageing data integrity recommendations across all health services to enable swifter pro-active follow up by the Department and resolution of issues by health services. This will include requiring evidence of implementation of recommendations at follow up. Audit contractors will be instructed to provide recommendations that are concise, specific and readily able to be measured, to minimise the number of ageing recommendations.

References

1. World Health Organization, WHO Technical Reports Series; no. 996 Annex 5 – Guidance on good data and record management practices, Geneva: WHO, 2016.
2. Duckett S, Cuddihy M and Newnham H, Targeting zero: Supporting the Victorian hospital system to eliminate avoidable harm and strengthen quality of care. Report of the Review of Hospital Safety and Quality Assurance in Victoria. Melbourne: Victorian State Government, 2016.
3. Victorian Auditor-General, Efficiency and Effectiveness of Hospital Services: Emergency Care, Melbourne: Victorian Auditor's General Office, 2016.
4. Victorian Agency for Health Information, Elective Surgery Waiting List: A rapid review to ensure full transparency, Melbourne: Victorian State Government, 2017.



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