The nKPI data collection

Data quality issues working paper

The nKPI data collection: data quality issues working paper

2012–2014

Australian Institute of Health and Welfare
Canberra
Cat. no. IHW 153

Contents

Abbreviations

ACCHOs	Aboriginal Controlled Community Health Organisations
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AMS	Aboriginal Medical Service
COPD	Chronic obstructive pulmonary disease
GP	general practitioner
GPMP	General Practitioner Management Plan
HbA1c	glycosylated haemoglobin
HfL	Healthy for Life
MBS	Medicare Benefits Schedule
METeOR	Metadata Online Registry
nKPI	National Key Performance Indicators for Indigenous primary health care
NSW	New South Wales
NT	Northern Territory
OSR	Online Service Reporting
PCIS	Primary Care Information System
PIRS	Patient Information Recording System
Qld	Queensland
SA	South Australia
Tas	Tasmania
TCA	Team Care Arrangement
Vic	Victoria
WA	Western Australia

Main findings

The aim of this paper was to:

- identify the most common data quality issues in the nKPI data collection
- identify the reasons for these issues
- provide options for consideration to reduce the number of exception reports.

Exception reports are issued when data quality problems are identified in data submitted to the AIHW from health services. Exception reports are a mechanism through which health services can manually correct their nKPI data by enabling services to resubmit data. The issuing of exception reports and the resubmission process adds to the time taken to finalise data submissions and increases the workload for health services because of complex data checking, investigation and resubmission.

This paper examines the exception reporting process through:

- the extent of data quality issues and the number of exception reports issued over time
- the characteristics of health services that have data quality issues and exception reports
- the main reasons for exception reports
- the indicators that cause the most issues for health services.

While the AIHW has collated and analysed data on the issues outlined above, this paper does not cover all the possible factors that can contribute to data quality problems, for example, issues caused by inexperienced staff, errors in data entry or software faults. This analysis is based on a data validation process (which ensures quality data is collected) and comments provided by health services.

Characteristics of services

The analysis was undertaken for the following 3 groups of services:

- Group 1—comprising Indigenous-specific health services funded by the Australian government to deliver the former Healthy for Life (HfL) program and who have participated in the nKPI data collection since June 2012 (and in the Healthy for Life data collection since 2007 for most organisations).
- Group 2—comprising other health services, Indigenous-specific and non-Indigenous-specific that are funded by the Australian government to deliver the primary health care services to Indigenous people. These services have participated in the data collection at different periods from December 2012.
- Group 3—Northern Territory (NT) Government Indigenous-specific health services funded by the Australian Government that have a unique computer system which includes features not shared by other funded health services.

Most of the analyses in this paper focussed on Group 1 and Group 2 services, with Group 3 services discussed at the end. There are a number of differences between these two groups. The majority of the Group 1 health services are Aboriginal Controlled Community Health Organisations (ACCHOs) that deliver primary health care services. Group 2 health services are a much more diverse group, with slightly less than half non-ACCHO health services including Medicare locals, and maternal and child health services. A larger number of Group

2 health services do not provide all aspects of primary health care that the nKPI data collection seeks to capture.

Key findings in relation to health services with data quality issues in June 2014 are outlined below:

- Less than one-third of the Group 1 health services had data quality issues compared with over one half of Group 2 health services.
- Only one-third of ACCHO services had issues compared with over three-quarters of non-ACCHO services (of the 43 non-ACCHO services participating, 33 had at least one data quality issue in June 2014).
- Smaller health services were more likely to have data quality issues—60% of services with 250 or less clients had issues compared with 33% of services with more than 2,000 clients.
- The type of Patient Information Recording System used was related to the number of data quality issues. Only 17% of services that used Communicare had data quality issues compared with:
  - all health services that used MMEX
  - 76% that used unspecified types of systems
  - 58% that used Best Practice
  - 41% that used Medical Director.
- Three-quarters of services that submitted their data manually were more likely to have data quality issues compared with 28% that submitted their data electronically through PEN CAT.

An analysis of the 15 health services that were issued with exception reports for all reporting periods confirmed many of the above findings:

- 4 health services were Group 1 services and 11 were Group 2 services
- 10 were small services
- only 1 used Communicare PIRS
- 4 used electronic data submission compared to 11 manual submitters.

Exception reports

The overall trend in the proportion of health services issued with at least one exception report is decreasing (44% in June 2012 to 35% in June 2014). When new indicators are added to the nKPI collection, however, the number of exception reports issued increases. For example, in June 2013 when 8 new indicators were added, 42% of health services were issued with at least one exception report.

The addition of new indicators increases the likelihood of an exception report being issued by adding more potential sources of error. This is because the denominators, and sometimes the numerators, of the new indicators need to be consistent with other indicators in the collection.

Indicators that most commonly lead to exception reports

It is difficult to determine which particular indicators lead to the most exception reports as these are usually issued due to inconsistencies between indicators. Analyses of indicators with data issues show that both Group 1 and Group 2 health services were most likely to have data quality issues with the MBS Health assessments, Birthweight recorded, Child immunisation and GP management plan (GPMP).

Analysis of the comments that health services provided in June 2013 for one MBS indicator, health assessments, shows that:

- 24 health services (14% of services reporting) commented that their organisation did not provide this health service
- 18 health services (11%) advised that they provided the service but did not have enough GPs to complete as many health assessments as required
- 10 health services (6%) said they provided the service but did not claim it as an MBS item
- 3 health services (1.8%) had trouble extracting the data electronically.

Health services are required to report on each nKPI indicator, even if they do not provide this type of service. If a health service has clients who meet the denominator definition (for example, in the relevant age category, or babies born, or clients with diabetes) they are required to report the number of clients (broken down by age and sex in the denominator), with zeros in the numerator. If they have no clients who meet the denominator definition, they are required to provide zero for both numerator and denominator. If the denominator data they provide for an indicator is not consistent with other indicators that it is validated against, a service may be issued with an exception report even where they don't actually provide the health service to any clients.

An analysis of the indicators for which services reported zeros in the numerator and/or the denominator in June 2014, for example, shows the following:

- The indicators with the largest number of services reporting zero in the numerator only were PI15 Influenza immunisation (32 services), PI03 Health checks 0-4 year olds (29 services) and 25 years and over (21 services).
- The indicators with the largest number of services reporting zero in both the numerator and the denominator were PI15 Influenza immunisation for clients with COPD (58 services) and for clients with type 2 diabetes (29 services), and PI13 First antenatal visit (29 services).

Implications

A range of responses are suggested to improve the data collection process and reduce the number of exception reports. Some of these could be implemented quite quickly and easily, and some will require greater costs and longer time frames. Further consideration of these options is therefore required.

Options for further consideration

1. Encourage and train services to undertake more validation of data at the service level before data are submitted to AIHW. The AIHW user manual could assist with this, along with the development of a one page checklist for services to ensure that they review and

check their data before submitting it. In addition, more training and education of service providers could be undertaken.

2. Address known issues in relation to software and data extraction, for example services using MMEX and manual submissions could be encouraged to use a system compatible with the data extraction tool.

3. Increase flexibility in the system through adoption of a module type system which requires organisations to only complete indicator data for the health services that they actually deliver and they should not be required to provide any data for indicators that are not applicable to their service delivery model.

The analysis also has implications for the way that we currently report national data. The differences in the models of care and the structures of reporting systems, which are likely to become increasingly diverse, suggest that national data would be more meaningful and useful if it were reported by grouping similar types of services. AIHW does not currently receive data that would allow these groupings.

1. Background

The national Key Performance Indicators (nKPI) for Aboriginal and Torres Strait Islander Primary Health Care data collection has been conducted for five reporting periods, after an initial trial involving around 80 organisations in March 2012. The number of participating organisations increased from 90 in the first reporting period in June 2012 to 210 in the reporting period in June 2014. The 90 services that started reporting in June 2012 had also participated in the Healthy for Life (HfL) program which collected similar indicator data and therefore had experience in data management. The remaining services were all new to this indicator-based data collection.

The number of indicators in the collection increased from 11 in June and December 2012 collection periods to 19 from June 2013. Many of the new indicators were new to both the HfL and other services.

The nKPI data are collected every 6 months, reported back to organisations at the individual service level and compiled for national reporting purposes. The raw data received from health services are carefully checked to identify any data quality issues and, in consultation with services through an 'exception reporting' process, the data are corrected before they are used in any type of reporting.

The main purpose of the paper was to identify the most common data quality issues that lead to the issuing of exception reports, and then to propose improvements that will reduce the number of exception reports issued. This is because the issuing of an exception report adds considerable time to the data collection process. The paper includes information on the main reasons for data quality issues, whether the data issues and reasons for them are the same over time, whether they are for the same indicators and the same services, and whether there have been any improvements in data quality over time. It also proposes steps that can be taken to reduce the data errors and therefore reduce the number of exception reports needed.

It should be noted, however, that the AIHW has information on data quality issues as they are identified through a validation process, or as outlined in comments provided by services. Validation includes checking for internal consistency of data (e.g. ensuring the number of people with diabetes is the same across relevant indicators), or that the correct populations were used for indicators (e.g. population for a 6 month period). We are able to provide data on the characteristics of services that have data quality issues, for example, the software systems that they use, whether they use PEN CAT to extract the data, their size and location, and whether they have data issues over a number of reporting periods.

The service comments are provided by the service when they have known data issues with a particular indicator. They offer some insight into what a service sees as the main problems in providing the data. But we may not always know in detail what caused some data issues, such as whether it was a data entry error, or the system was offline, or the doctor failed to update the system. This type of information is sometimes revealed anecdotally in telephone conversations with services, but it has not been systematically documented.

While the AIHW has collated and analysed data on the issues outlined above, we don't have information on all the possible factors that can contribute to data quality problems. The analysis was based on whether the data services provided met a specified set of criteria identified through a validation process by AIHW, and analyses of comments provided by

services on the quality of their data. But the AIHW doesn't know everything that happens at the service level that can contribute to data errors, for example whether these were caused by inexperienced staff, errors in data entry or software faults. This type of information is sometimes revealed anecdotally in telephone conversations with services, but it has not been systematically documented.

1.1 The data collection process

The end-to-end process of collecting data from services and the AIHW review and reporting processes are described in some detail below and outlined in Figure 1.

How the data are collected from organisations

Data for the nKPIs are collected from an individual organisation through a web-based system called OCHREStreams. This system enables an electronic transfer of data from each health service's Patient Information Recording System (PIRS), thus minimising any data errors associated with manual completion of data submissions. A Clinical Audit Tool (CAT), is used to extract data from PIRS. This is referred to as the PEN CAT, with PEN being the name of the company that developed the tool. The PEN CAT, however, can only be used with clinical software that is compatible with it (see Box 1 for a list of compatible PIRS).

The PEN CAT interacts with different PIRS in different ways. For some systems the PEN CAT 'pulls' the data from the PIRS and so the PEN CAT does the mapping of the data. For other systems (such as Communicare and PCIS) it is the PIRS that 'pushes' the data onto PEN CAT. This means that the mapping between these systems and PEN CAT is done by relevant software vendors or, in case of PCIS, by a data manager at the NT Government. . The MMEX system does not interact with the PEN CAT at all and pushes the data directly onto OCHREStreams.

The data extracted from the relevant PIRS are used to populate nKPI data (the nKPI extract) and this extract is sent back to the health service for review before the CEO authorises the release of the data to the AIHW. An automatically generated email notifies the AIHW when the data are submitted for AIHW extraction through OCHREStreams.

Box 1: Clinical software systems for use with the PEN CAT

Compatible software systems include:
- Medical Director (MD) 2 and 3
- Best Practice (BP) v1.6.0.395 or later
- PractiX v1.36 build 2 or later
- Communicare v11.2 or later
- Medinet version released July 2011 or later.

In order to collect data based on MBS items, some software such as MD and BP also require supported billing software combinations.

Most organisations are required to submit their data electronically from their PIRS through OCHREStreams and, once extracted, they cannot make any manual alterations to the data. But organisations with no PIRS or those with software that does not meet the minimum system requirements, or which are incompatible with the PEN CAT or OCHREStreams, can upload data through a manual submission form. A manual submission can only be made by

services that have sought an exemption from the Department of Health from submitting data electronically.

Public

- Inform public
- Influence national policy
- Inform local community

Health service

Data collection and entry

Client records

- PIRS* (CAT compatible)
- MMEX
- Other

- Engage staff
- Inform board

CAT

Data improvement

Manual form

IF

OCHREStreams

Check by service CEO

nKPI reports repository

De-identified nKPI data

AIHW

AIHW data quality check ok?

Final report and slideshow for service

Exception report

No

Analysis

Yes

National report

National analysis

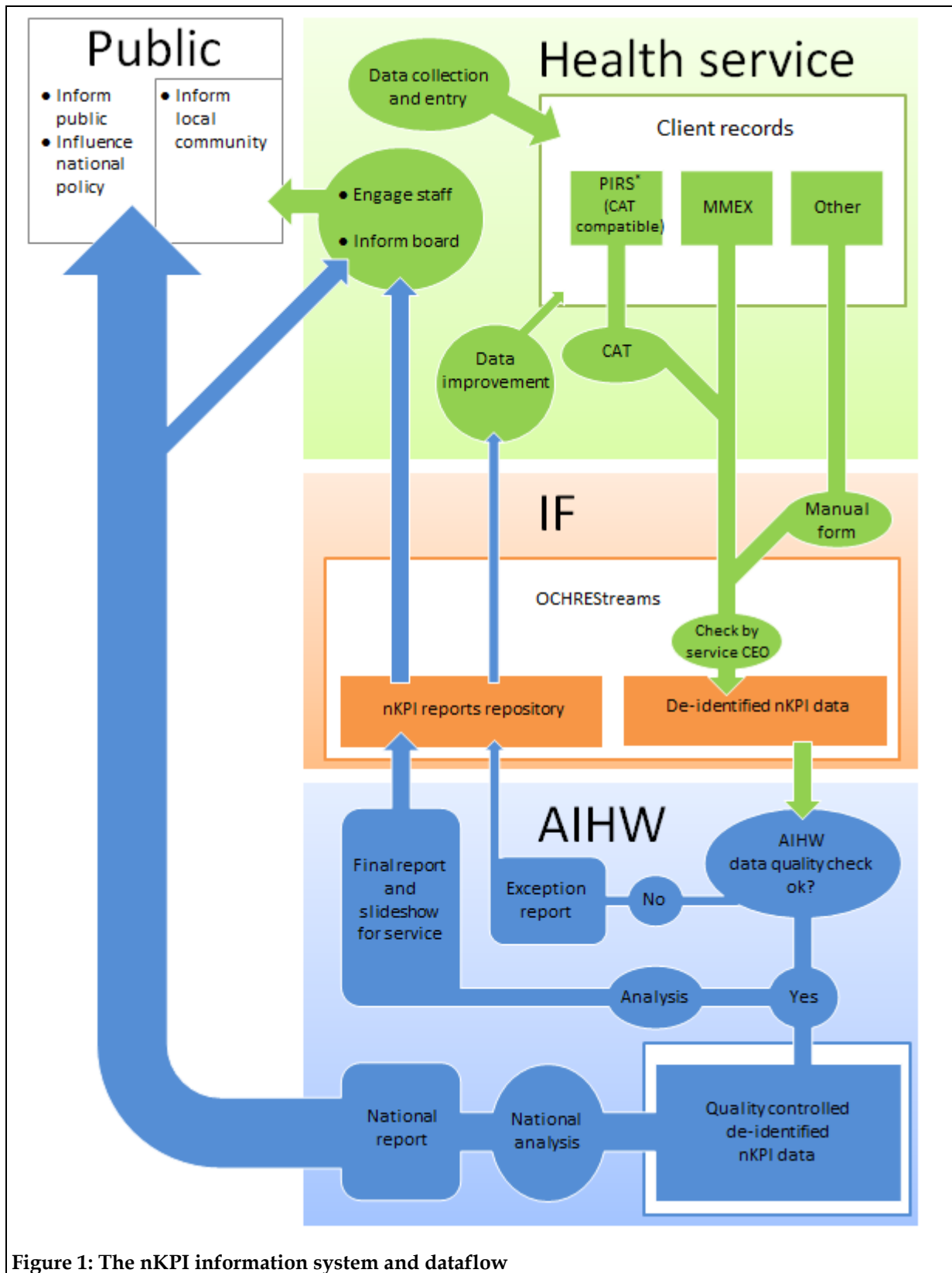Quality controlled de-identified nKPI data

Figure 1: The nKPI information system and dataflow

1.2   The data review process

Once the data have been submitted by the organisation, AIHW reviews the data to identify any data quality issues. A rigorous testing of data through a range of different checks is undertaken to ensure that the data are internally consistent and meet methodological requirements specified for each indicator. Common data quality issues identified include inconsistencies, not using the agreed national definitions and unexpected changes in numbers over time. The next section describes the assessment criteria in more detail.

If there are no data quality issues, the AIHW accepts the data and sends a final report with data analyses to services, along with a PowerPoint presentation of the findings via OCHREStreams. The report contains all data submitted by a service, including small numbers with no suppression, with time series and comparisons to national, state/territory and regional averages. The report is only for the exclusive use of the service to understand how they track over time and against services in the same region, jurisdiction and across Australia. The PowerPoint presentation contains data on all indicators if there are sufficient numbers to preserve confidentiality and also compares the service with other organisations in the same state/territory and national averages. This information can be used in public forums such as staff training, board meetings and peer group meetings.

Data quality checks

The AIHW undertakes validation checks to ensure that the data submitted by a service are consistent across related indicators and over time, and that they conform to national definitions as specified on Metadata Online Registry (METeOR). These checks include the following:

- Comparing totals and sub-totals to detect any differences in client numbers within and between indicators. For example, ensuring that age and sex breakdowns add to the total, or ensuring that the numerator is smaller than the denominator or similar, ensuring certain related indicators have the same denominators (for example, indicators that have clients with the same condition should have the same denominator) or else the numerator for one indicator is the same as the denominator for another.

- Comparing data across reporting rounds to identify any unexpected fluctuations.

- Checking data against comments provided by services. For example, services may indicate that data are incorrect or that they did not use the definition of a 'regular client'. This can be time consuming as these checks can only be done manually and require all related indicators to be checked even when no apparent internal inconsistencies were found with the data. This also requires contacting a service before sending an exception report to determine that data can be corrected.

- If there were inconsistent data for one component of an indicator (for example, the previous 6 months) all other components are also queried.

- If there was inconsistent data for one component of an indicator, then all linked indicators are queried.

Exception report process

As a result of the data review process and the validation checks outlined above, exception reports are raised for services where there are data quality issues that require manual

correction, and where services are able to provide corrected data. Around half of all exception reports are the result of these validation checks.

But there are also instances where services request an exception report as they have identified data issues during their review of their extract, and they need to correct their data manually. This is identified in the service comments where services indicate that there are data quality issues that require correction. In some cases, service comments may indicate that there are data quality issues, but the comments are ambiguous as to whether or not corrected data can be provided, and the AIHW then calls the service to determine if an exception report would be useful. Service comments are the reason for around one-third of all exception reports.

A small number of services have data quality issues but inform the AIHW that they are not able to provide corrected data and so will not be issued with an exception report.

The exception report outlines the areas where there are inconsistencies or other problems with the data, and opens up the relevant cells to allow services to manually change their data. Only those cells with problems will be open and able to be edited by a service. An example of part of an exception report is provided in Appendix 1. Each cell with data issues needs to be manually completed by AIHW staff which is time consuming when there are a substantial number of cells with problems present.

AIHW posts the exception report indicating what the data issues are onto OCHREStreams. Services then resubmit corrected data. The exception report process may require more than one iteration if the resubmitted data are still found to be incorrect. If all data issues have been resolved, AIHW accepts the data on OCHREStreams, and then prepares and sends a final service level report and PowerPoint presentation to the service. If data in the exception report cannot be corrected by the service, the data are partially accepted (this means some data quality issues remain unresolved) by the AIHW on OCHREStreams and a final report and PowerPoint presentation will be provided to the service via OCHREStreams.

1.3   Effect of incomplete data on national reports

If there are unresolved data quality issues with a service's submission, the data for relevant indicators are excluded from national analyses. This results in different numbers of services with valid data for different indicators. For example, if 200 services submitted data in a reporting period and all services provided valid data for indicator 1, then indicator 1 will have 200 services contributing data. But some of the same 200 services may not have valid data for indicator 3 and this will result in fewer services contributing data to that indicator. Further information on the number of services contributing valid data for each nKPI can be found in Appendix 3 (pp 72–76) of the report *National key performance indicators for Aboriginal and Torres Strait Islander primary health care: results from December 2013.*

2. Detailed analyses

This section provides an overall picture of the services with data quality issues. It then looks in more detail at the services issued with exception reports, including the types of services, whether the same services are issued with exception reports, the reasons for the exception reports and which indicators are affected.

As services were progressively introduced into the collection, for most tables, the report is broken down into three groups of services:

1. Group 1 comprising HfL life services who participated in the first nKPI data collection from June 2012 onwards.

2. Group 2 comprising new services who participated in the collection at varying times from December 2012 onwards.

3. Group 3 NT Government services who participated from June 2013 onwards. These services have somewhat unique issues and are discussed in a separate section at the end of the chapter.

The analyses in relation to indicators is also undertaken for two groups of indicators—for the 11 indicators that have been in the collection since it commenced, and for the 8 new indicators introduced to the collection in June 2013.

2.1 nKPI services and indicators

There have been 5 rounds of data collections for the nKPIs—June 2012, December 2012, June 2013, December 2013 and June 2014. Ninety organisations submitted data in the first round in June 2012. All these organisations had previously reported data for the HfL data collection and therefore had considerable experience in reporting indicator based data.

HfL organisations reported data to AIHW as part of continuous quality improvement program for organisations providing health care to Indigenous people funded by the Australian Government. These organisations had reported on a number of indicators— many of which were similar to the nKPIs—to the AIHW since 2007 using a web-based tool. The nKPI organisations who had participated in HfL are referred to as Group 1 HfL services in this report. By June 2014 there were 81 Group 1 HfL services participating in the collection.

In December 2012, 88 new services participated in the nKPI collection and provided data for the first time. Other services also joined the data collection after this (Table 1). These services are referred to as Group 2 services in this report.

Table 1: Number of services and indicators by collection round

	Number of services				Number of indicators
Collection round	Group 1 HfL[(a)]	Group 2	NT Government	Total	
June 2012	90	n.a.	n.a.	90	11
December 2012	85	88	n.a.	173	11
June 2013	86	91	29	206	19
December 2013	82	95	30	207	19
June 2014	81	97	32	210	19

n.a. Not available / not collected.

(a)   In December 2012, two services were exempted from reporting.

Differences between Group 1 and Group 2 services

Most of the Group 1 services that participated in the HfL data collection fit the standard ACCHO model of a stand-alone primary health care service that delivers the full suite of primary health care. The majority of these services are ACCHO services.

Group 2 services by comparison are a much more diverse group. Just over half were ACCHO services in June 2014. The AIHW does not have full information about the range of health services delivered by organisations, but it is apparent from service comments that there are a larger number of Group 2 services that don't deliver the full range of primary health care that the nKPI data collection seeks to capture. For example, between 5 and 10 organisations only deliver maternal and child health services, and there are a number of Medicare locals that don't provide all health services directly to clients.

Because of the different characteristics of the two groups, most of the tables report on them separately. In addition, because the Group 1 HfL services had more experience in providing indicator-based data it was assumed that they would have fewer data quality issues.

Northern Territory Government services

In June 2013 the Northern Territory Government services submitted data for 29 services, increasing the total number of services providing data to 206. The number of services submitting data has remained relatively stable since then, with only a few additional services added during each reporting period. There were a total of 210 services that submitted data in June 2014.

The data issues for the NT services are different from those of other organisations. They use a web-based system called Primary Care Information System (PCIS) and this enables health care workers to enter patient information onto the system from anywhere in the NT. Data are extracted from PCIS to a central repository, NT Department of Health data warehouse, through which individual service level data can be extracted for nKPIs by a single data manager. These services have been excluded from the analyses of data quality issues and are covered in a separate section at the end of this chapter.

Number of indicators

The number of indicators for which services were asked to provide data increased over the 5 collection rounds (Table 1). In June and December 2012 services were asked to provide data for 11 indicators, while from June 2013 onwards services were asked to provide data for 19

indicators (see Tables 8 and 9 for a full list of indicators). Adding additional indicators to the collection increases the likelihood of exception reports. This is because it increases the number of interrelated data that need to be consistent with other data provided, and because it requires organisations to understand any new data requirements.

The 8 additional indicators added in June 2013 increased the complexity of the collection by adding other potential sources of data validation error. This is because the denominators, and sometimes the numerators, for these indicators had to be consistent other indicators. For example, the denominator for PI18 Kidney function tests for clients with type 2 diabetes needs to be consistent with denominators for the other type 2 diabetes indicators. The two new indicators introduced in the December 2014 reporting period (Smoking status of women who gave birth and Kidney test results) will also increase the likelihood of exception reports because they are validated against other indicators in the collection.

2.2 Data quality issues

Services with and without data quality issues

The number and proportion of services with and without data quality issues, by reporting period, is shown in Table 2. While most services with data quality issues will be issued with an exception report, services which indicate they are not able to provide corrected data are not. As services gained more experience in the reporting process it would have been expected that the number and proportion of services that had no data issues would have increased over time, but this was complicated by the addition of new indicators to the collection which increased the likelihood of data issues.

Table 2: Services with and without data issues at first submission, by reporting period[a]

	June 12		December 12		June 13[b]		December 13		June 14	
	No.	%	No.	%	No.	%	No.	%	No.	%
No data issues, no exception report	46	51.1	108	62.4	77	43.5	98	55.4	100	56.2
With data issues and exception reports:										
1 exception report	27	30.0	43	24.9	50	28.2	39	22.0	47	26.4
2 exception reports	7	7.8	17	9.8	18	10.2	20	11.3	18	10.1
3+ exception reports	7	7.8	4	2.3	14	7.9	8	4.5	5	2.8
Total services with exception reports	*41*	*45.5*	*64*	*37.0*	*82*	*46.3*	*67*	*37.9*	*70*	*39.3*
With data issues, no exception reports[c]	3	3.3	1	0.6	18	10.2	12	6.8	8	4.5
Total services	**90**	**100.0**	**173**	**100.0**	**177**	**100.0**	**177**	**100.0**	**178**	**100.0**

(a)   Excludes NT Government services that submitted data from June 2013 onwards.

(b)   In June 2013, data for 8 new indicators were added to the collection.

(c)   A service may have data issues but not be able to provide correct data, so no exception report will be issued.

The data reflect both these trends. The number and proportion of services with no data issues was highest in the December 2012 reporting period (nearly 2 in 3). This number decreased in June 2013, when the new indicators were added to the collection. It then increased again in December 2013. The corresponding number and proportion of services issued with at least one exception report increased from 64 services (37%) in December 2012 to 82 (46%) in June 2013 when the new indicators were added. It was more stable in the last two reporting periods—67 services (38%) in December 2013 and 70 services (39%) in June 2014.

Characteristics of services with data quality issues

Of the 178 nKPI services who submitted data in June 2014 (excluding NT Government services), 78 or 44% had at least one data issue (Table 3). Analyses of the characteristics of services with data quality issues showed the following:

- Less than one-third of Group 1 HfL services (30%) had issues compared with over one half (56%) of Group 2 services.

- One-third of ACCHO services had issues compared with over three-quarters of non-ACCHO services (of the 43 non-ACCHO services participating 33 had at least one data quality issue).

- Smaller services were more likely to have issues—60% of services with 250 or less clients had issues compared with one-third of services with more than 2,000 clients.

- Only one in six services (17%) that used the Communicare recording system had issues compared with those who used MMEX (100%), Best Practice (58%), Medical Director (41%), Other PIRS (100%) and Unspecified Types (76%).

- All services that used MMEX or an 'unknown' method to submit their data had data quality issues.

Table 3: Characteristics of services[a] with data quality issues, June 2014

Characteristics	Number of services with issues	Total number of services	Per cent of services with issues
Wave			
Group 1 — HfL services	24	81	29.6
Group 2 — Other services	54	97	55.7
Service type			
ACCHO	45	135	33.3
Non-ACCHO	33	43	76.7
Service Size			
0 to ≤250 clients	22	37	59.5
>250 to ≤500 clients	9	25	36.0
>500 to ≤1,000 clients	13	32	40.6
>1,000 to ≤2,000 clients	18	36	50.0
>2,000 clients	16	48	33.3

(continued)

Table 3: (continued) Characteristics of services[a] with data quality issues, June 2014

Characteristics	Number of services with issues	Total number of services	Per cent of services with issues
Remoteness			
Major cities	10	26	38.5
Inner regional	24	46	52.2
Outer regional	21	47	44.7
Remote	9	22	40.9
Very remote	12	35	34.3
Not stated	2	2	100.0
Type of recording system			
Medical Director	18	44	40.9
Communicare	12	71	16.9
Best Practice	11	19	57.9
MMEX	11	11	100.0
Other PIRS[b]	4	4	100.0
Unspecified	22	29	75.9
Submission method			
Electronic — PEN CAT	34	123	27.6
Electronic — MMEX	11	11	100.0
Manual	31	42	73.8
Unknown	2	2	100.0
Total	**78**	**178**	**43.8**

(a)   Excludes NT Government services.

(b)   'Other PIRS' includes Ferret (1 service), Zedmed (1), CME (1), PCIS (1).

2.3 Exception reports

Number of services

This section examines the services that have been issued with exception reports in more detail, and looks at Group 1 and Group 2 services separately. As noted previously, NT Government services were excluded and are discussed separately at the end of the report. Services that use an MMEX electronic information system were also excluded from this analyses as it is already known that all these services have difficulties extracting the data, and that all were issued with an exception report in each reporting period. There were 7 MMEX services that reported data in December 2012, and 11 in all 3 subsequent reporting periods to June 2014.

Overall, just over one-third of services (35%) were issued with at least one exception report in June 2014. But there were differences between the Group 1 and 2 services in the pattern of exception reports (Table 4).

The general trend for Group 1 HfL services is one of decreasing numbers (and proportions) of services being issued with exception reports. In June 2012 40 (44%) Group 1 HfL services were issued with at least one exception report, while in June 2014 this had decreased to

22 (27%) services. The exception to this trend was for the June 2013 reporting period when 8 new indicators were added to the collection. But the general trend indicates that data quality for these services has improved over time.

The pattern for Group 2 services, the first of which began providing data from December 2012 onwards, is different. Both the number and proportion of services issued with exception reports showed no clear trend over the 4 reporting periods (with proportion ranging from 38% to 43%).

Table 4: Services with at least one exception report, by type of service, June 2012–June 2014

	Group 1—HFL services			Group 2—Other services			Total services[a]		
	Total services	No. with ex reports	% with ex reports	Total services	No. with ex reports	% with ex reports	Total services	No. with ex reports	% with ex reports
Jun 12	90	40	44.4	n.a.	n.a.	n.a.	90	40	44.4
Dec 12	85	27	31.8	79	30	38.0	164	57	34.1
Jun 13[a]	83	35	42.2	83	36	43.4	166	71	42.3
Dec 13	82	23	28.0	84	33	39.3	166	56	33.7
Jun 14	81	22	27.2	86	37	43.0	167	59	35.3

n.a. Not available / not collected.

(a)   In June 2013, data for 8 new indicators were added to the collection.

Note: Excludes NT Government and MMEX services.

Time to complete the data collection process

Exception reports add to the time taken to complete the data collection process and the burden on staff in both the services and at AIHW. An exception report can only be created manually to allow incorrect cells to be corrected (see Appendix A for an example). Once services are issued with an exception report they are required to manually correct their data and resubmit their report. Services may be issued with more than one exception report if their resubmitted data are not correct. The issuing of an exception report also indicates that a service has poorer quality data.

The analysis of the time taken to complete the data collection process by exception report status is shown in Table 5. The time taken was measured from when the service first submitted their data to when their data were fully or partially accepted.

- For services with no exception reports, 94% had their data accepted within two weeks after initial submission and 80% had their data accepted within one week.

- For services with one exception report, 21% had their data accepted within one month of initial submission, 72% by 2 months and 92% by 3 months.

- For services with two or more exception reports, none had their data accepted within one month, while 35% had their data accepted by 2 months, and 78% by 3 months.

In June 2014 there were 15 services (8%) whose data were only partially accepted at the end of the process, which means that there were still some issues with their data that could not be resolved. All of these services were issued with at least one exception report.

Table 5: Number of services by time taken to complete the data collection process and exception report status, June 2014

	No exception reports[a]		One report		Two or more reports		Total services	
	No.	Cumulative %	No.	Cumulative %	No.	Cumulative %	No.	Cumulative %
Less than 1 week	86	79.6	..	..	..	..	86	48.3
1 to 2 weeks	16	94.4	..	..	..	..	16	57.3
2 to 3 weeks	1	95.4	3	6.4	..	..	4	59.5
3 weeks to 1 month	3	98.1	7	21.3	..	..	10	65.2
1–2 months	2	100.0	24	72.3	8	34.8	34	84.3
2–3 months	..	..	9	91.5	10	78.3	19	94.9
3–4 months	..	..	4	100.0	5	100.0	9	100.0
Total with all data accepted	*108*	*100.0*	*35*	*74.5*	*20*	*87.0*	*163*	*91.6*
Total with partially accepted data	*0*	*0.0*	*12*	*25.5*	*3*	*13.0*	*15*	*8.4*
Total services	**108**	**100.0**	**47**	**100.0**	**23**	**100.0**	**178**	**100.0**

.. Not applicable.

(a) Even if services are not issued with an exception report the process can take some time as services may still have issues that need to be clarified by contacting the service, or their data may be submitted in the peak period and can take some weeks to process.

Note: NT Government and MMEX services were excluded from this table.

Number of exception reports

Table 6 provides data on the number of exception reports issued over the 5 reporting periods for the two groups of services and shows the following:

- The proportion of Group 1 HfL services issued with no exception reports increased from 56% in June 2012 to 73% in June 2014, while the proportion issued with more 2 or more exception reports decreased from 16% to 9% over the same period.

- There was no clear trend for Group 2 services:
  - the proportion issued with no exception reports ranged from 57% to 62% over the four periods from December 2012 to June 2014
  - the proportion issued with 2 or more exception reports ranged from 14% to 20% of services over the same period.

Table 6: Services by number of exception reports issued, December 2012 to June 2014

	June 2012		December 2012		June 2013[a]		December 2013		June 14	
	No.	%	No.	%	No.	%	No.	%	No.	%
Group 1 HfL service										
None	50	55.6	58	68.2	48	57.8	59	72.0	59	72.8
1 only	26	28.9	20	23.5	24	28.9	18	22.0	15	18.5
2 or more	14	15.6	7	8.2	11	13.3	5	6.1	7	8.6
Total	**90**	**100**	**85**	**100**	**83**	**100**	**82**	**100**	**81**	**100**
Group 2 services[a]										
None	n.a.	n.a.	49	62.0	47	56.6	51	60.7	49	57.0
1 only	n.a.	n.a.	18	22.8	23	27.7	16	19.0	25	29.1
2 or more	n.a.	n.a.	12	15.2	13	15.7	17	20.2	12	14.0
Total	**n.a.**	**n.a.**	**79**	**100**	**83**	**100**	**84**	**100**	**86**	**100**
All services										
None	50	55.6	107	65.2	95	57.2	110	66.3	108	64.7
1 only	26	28.9	38	23.2	47	28.3	34	20.5	40	24.0
2 or more	14	15.6	19	11.6	24	14.5	22	13.3	19	11.4
Total	**90**	**100**	**164**	**100**	**166**	**100**	**166**	**100**	**167**	**100**

n.a. Not available / not collected.

(a) Services were asked to provide data for 11 original indicators for the June and December 2012 reporting periods. From the June 2013 reporting period onwards services were asked to provide data for an 8 new indicators, a total of 19 indicators.

(b) Only Group 1 HfL services submitted data in June 2012, with Group 2 services reporting for the first time in December 2012.

Note: Excludes NT Government services, and services who use the MMEX electronic patient information system.

Main reasons

There are a number of reasons why services may be issued with an exception report. The most common are validation issues, that is, where there were internal inconsistencies in the data provided, the data were not logical or there were large unexplained changes in the data over time. A very common issue found through validation is where two indicators have the same denominator populations but the numbers provided for these two indicators are different. Appendix A shows an example from an exception report where the denominator provided (total number of clients in PI03 - Health assessments aged 25 and over, PI09 - Smoking status and PI16 - Alcohol consumption) should all be the same, but they are not. This needs to be corrected by the service.

Services may also be issued with an exception report when they provide comments that indicate that there are data quality issues in their submission that need manual correction, or in some cases where there are data quality issues but no explanation is provided. When services do not provide an explanation for data quality issues, they will be contacted through the Data Quality Helpdesk and then, if required, an exception report will be issued.

Issues with extracting the data using PEN CAT is another common reason for the issuing of an exception report. The exception report then allows services to manually input the correct data.

The main reason for the issuing of exception report for the two groups of services is shown in Table 7. Just under one-third (31.8%) of Group 1 services were issued with exception

report due to data validation issues in June 2014, while just under half were issued with an exception report due to service comments (46%). The relatively high proportion for service comments suggests that these services were aware of issues with their data and the need to correct them. Problems extracting data (23%) and data not captured or incomplete (9%) affected a lower proportion of services in June 2014.

For Group 2 services, a larger proportion had validation issues with this proportion ranging from 72% to 57% over the four collection periods for which they provided data. Service comments were a less common reason among these services, but increased over time suggesting that services had gained a greater understanding of their data issues (ranging from 3% of services in December 2012 to 35% in June 2014). Problems extracting data (5%) and data not captured or incomplete (8%) affected a smaller proportion of these services in June 2014.

Table 7: Services with exception reports[a] **by reasons**[b]**, December 2012–June 2014**

	June 2012		December 2012		June 2013		December 2013		June 14	
	No.	%	No.	%	No.	%	No.	%	No.	%
Group 1 HfL services										
AIHW validation checks	8	20.0	14	51.9	16	45.7	10	40.0	7	31.8
Service level reasons:										
Service comments	18	45.0	5	18.5	10	28.6	7	28.0	10	45.5
Problems extracting data (PEN CAT issues)	6	15.0	3	11.1	3	8.6	4	16.0	5	22.7
Data not captured/incomplete	6	15.0	3	11.1	6	17.1	2	8.0	2	9.1
Other	2	5.0	2	7.4	0	0.0	2	8.0	1	4.5
Total services	**40**	**100**	**27**	**100**	**35**	**100**	**25**	**100**	**22**	**100**
Group 2 services[c]										
AIHW validation checks	n.a.	n.a.	19	63.3	26	72.2	22	66.7	21	56.8
Service level reasons:	n.a.	n.a.								
Service comments	n.a.	n.a.	1	3.3	7	19.4	8	24.2	13	35.1
Problems extracting data (PEN CAT issues)[d]	n.a.	n.a.	3	10.0	3	8.3	2	6.1	2	5.4
Data not captured/incomplete[d]	n.a.	n.a.	8	26.7	2	5.6	4	12.1	3	8.1
Other	n.a.	n.a.	0	0.0	1	2.8	3	9.1	1	2.7
Total services	**n.a.**	**n.a.**	**30**	**100**	**36**	**100**	**33**	**100**	**37**	**100**

n.a. Not available / not collected.

(a)   Excludes NT Government services, and services that use the MMEX electronic patient information system.

(b)   Services may have more than one reason for Exception reports.

(c)   Only HfL services submitted data in June 2012, with other services reporting for the first time in December 2012.

(d)   These reasons may refer to the same issue.

Indicators affected

It can be difficult to determine which particular indicators cause the most problems as often an exception report is issued because of inconsistencies between indicators and it is not

known which indicator has the problem. Tables 8 and 9 counted the indicators with data issues when the exception report was issued.

Looking over the last 5 data collection periods for Group 1 HfL services, the indicators for which services were most likely to have data issues were the MBS items (Health assessments, Team Care Arrangements (TCA), GP management plan (GPMP)). There were a number of services with issues concerning the additional indicators when they were introduced in June 2013, particularly cervical screening, kidney tests and influenza immunisation, but this number decreased for the June 2014 reporting period. For this period, Group 1 HfL services were most likely to have issues with Birthweight recorded, MBS Health assessments, MBS GP management plan and Child immunisation (Table 8).

Table 8: Group 1 HfL services issued with exception reports: number of services with issues by indicator

	Jun 12	Dec 12	Jun 13	Dec 13	Jun 14
Original indicators					
PI01: Birth weight recorded	13	9	7	6	7
PI03: MBS health assessments	26	14	16	10	8
PI05: HbA1c test	12	10	8	11	4
PI06: HbA1c result recorded	12	8	6	10	4
PI07: MBS GPMP	19	15	12	11	7
PI08: MBS TCA	20	16	12	11	6
PI09: Smoking status recorded	10	10	10	8	3
PI12: BMI result	5	4	11	7	3
PI16: Alcohol use recorded	20	10	10	7	3
PI23: Blood pressure test	8	7	8	8	4
PI24: Blood pressure ≤130/80mmHg	7	2	3	3	1
New indicators					
PI02: Birth weight result	n.a.	n.a.	6	8	6
PI04: Child immunisation	n.a.	n.a.	6	5	7
PI10: Smoking status result	n.a.	n.a.	3	3	1
PI13 First antenatal visit	n.a.	n.a.	6	7	5
PI14 Clients 50+ immunised	n.a.	n.a.	3	3	2
PI15: Influenza immunisation	n.a.	n.a.	9	7	5
PI18: Kidney tests	n.a.	n.a.	9	10	5
PI22: Cervical screening	n.a.	n.a.	15	7	5
Total services	**40**	**27**	**35**	**25**	**22**

n.a. Not available / not collected.

Note: New indicators were added to the collection in June 2013.

For Group 2 services, for which all indicators were essentially new, MBS Health assessments, smoking status recorded and alcohol use recorded generated the most issues (Table 9). There was a decrease in the number of services with issues across almost all indicators for the June 2014 reporting period. In that reporting period, Group 2 services were most likely to have issues with Birthweight recorded, MBS Health assessments, MBS GP management plan and Child immunisation (that is, for the same indicators as Group 1).

Table 9: Group 2 services issued with exception reports: number of services with issues, by indicator

	Dec 12	Jun 13	Dec 13	Jun 14
Original indicators				
PI01: Birth weight recorded	11	9	8	7
PI03: MBS health assessments	14	15	24	20
PI05: HbA1c test	15	12	15	6
PI06: HbA1c result recorded	11	7	6	5
PI07: MBS GPMP	15	13	14	9
PI08: MBS TCA	15	13	15	8
PI09: Smoking status recorded	10	17	22	10
PI12: BMI result	5	6	12	7
PI16: Alcohol use recorded	13	18	23	11
PI23: Blood pressure test	12	13	14	6
PI24: Blood pressure ≤130/80mmHg	2	4	3	3
New indicators				
PI02: Birth weight result	n.a.	8	11	5
PI04: Child immunisation	n.a.	9	8	6
PI10: Smoking status result	n.a.	4	6	4
PI13 First antenatal visit	n.a.	7	8	6
PI14 Clients 50+ immunised	n.a.	2	4	4
PI15: Influenza immunisation	n.a.	12	13	7
PI18: Kidney tests	n.a.	14	13	6
PI22: Cervical screening	n.a.	13	16	8
Total services	**30**	**36**	**33**	**37**

n.a. Not available / not collected.

Note: Excludes NT Government and MMEX services.

Services reporting zero for indicators

Services can report zero for indicators if they have not provided the particular service to any clients in the reporting period. It is important to note that even if an organisation does not ever provide a particular health service, they are still required to report on each indicator.

If a service has clients who meet the denominator definition they are required to report the number of clients broken down by age and sex in the denominator, with zeros in the numerator. If they have no clients who meet the denominator definition (for example, none in the relevant age category, or babies born, or clients with diabetes) they are expected to provide zero for both numerator and denominator, though this is automated for organisations reporting electronically rather than manually. If the denominator data they provide for an indicator are not consistent with other indicators that they are validated against, a service may be issued with an exception report. Even if they don't actually provide the service, they are expected to be able to provide a consistent count of their clients.

An analyses of the indicators for which services reported zeros in the numerator and/or the denominator in June 2014 showed the following:

- The indicators with the largest number of services reporting zero in the numerator only were PI15 Influenza immunisation (32 services); PI03 Health checks 0–4 year olds (29 services) and 25 years and over (21 services).
- The indicators with the largest number of services reporting zero in both the numerator and the denominator were PI15 Influenza immunisation for clients with COPD (58 services) and for clients with type 2 diabetes (29 services); and PI13 First antenatal visit (29 services).

In-depth analyses of PI03 MBS health assessments

In-depth analyses of service comments were undertaken for the MBS health assessments indicator to understand the reasons why services reported zeros. Further analyses could examine the service comments for other indicators in the collection.

For the MBS items to be counted in the data collection, the relevant service must be provided by a GP and billed to Medicare. As the MBS items appear to cause particular problems for services, the indicator PI03 was examined in more depth to try and get a better understanding of the issues services have in providing good quality data. This was done by looking in more detail at the service comments provided for this indicator in the June 2013 reporting period. Services add their comments to particular indicators as explanations when they are providing the data.

The service comments shows that the following issues were the most common ones raised by services in relation to MBS health assessments (Table 10):

- 24 services (14% of services reporting) commented that their organisation does not provide this health service
- 18 services (11%) said they provided the service but did not have enough GPs to complete as many health assessments as they needed to
- 10 organisations (6%) said they provided the service but did not claim it as an MBS item
- 13 services (8%) said they had software issues of some kind
- 3 services (1.8%) had trouble extracting the data by PEN CAT.

Table 10: Service comments on PI03 MBS health assessments by category, June 2013

Reason	Number	Per cent
Service not provided by our organisation	24	14.5
Not enough GPs in our organisation	18	10.8
Service provided but not claimed as MBS item	10	6.0
Software problems	13	7.8
PEN CAT problem	3	1.8
Information not recorded correctly in PIRS	7	4.2
Other	12	7.2
Total services who provided comments	*87*	*52.4*
Total services who provided data	**166**	**100.0**

Note: Excludes NT Government services but includes MMEX services.

A list of the services that did not provide MBS health assessments and a summary of their comments are provided in Table 11. The table shows that there were a larger number of Group 2 services that did not provide MBS health assessments, and that Group 2 services represent a wider range of service types:

- Around 7% (6 out of the 86) Group 1 services that provided data in the June 2013 reporting period did not provide MBS health assessments compared with 20% (18 out of the 91) Group 2 services.

- There were around 8 of the Group 2 services that appear to provide services to mothers and babies only, and that do not provide the full range of primary health care.

- There were also 4 Medicare locals reporting (3 in Group 1 and 1 in Group 2) who do not provide MBS services directly to clients.

Table 11: Services that did not provide MBS health assessments: service comment June 2013

Name	Comment
Group 1 HfL services	
Service 1.1 (Medicare Local)	Not a Medicare provider
Service 1.2 (Medicare Local)	Our service does not complete or submit these
Service 1.3 (Medicare Local)	Our service does not claim MBS health assessments
Service 1.4	Funding and records with a Division of GPs
Service 1.5	Don't do direct billing of health care
Service 1.6	Service doesn't have a GP
Total number	*6*
% of all Group 1 services	*7.0*
Group 2 services	
Service 2.1 (Child and family service)	Service does not provide these assessments
Service 2.2 (Infant and child health service)	Our service separate to the GP service
Service 2.3 (Mothers and babies service)	Mums and bubs service only
Service 2.4 (Mothers and babies service)	Postnatal service
Service 2.5	Not a stand-alone Aboriginal Medical Service (AMS)
Service 2.6	Doesn't apply to our service
Service 2.7	Not provided by this service
Service 2.8	Not provided by this service
Service 2.9	Not funded to provide
Service 2.10 (Mothers and babies service)	Not provided
Service 2.11 (Mothers and babies service)	Did not provide for 0–4 year olds
Service 2.12	Do not employ a GP
Service 2.13	NA
Service 2.14	Does not do
Service 2.15 (Mothers and babies service)	Antenatal services doesn't do health checks
Service 2.16 (Mothers and babies service)	Mothers and babies service, can't bill 715s
Service 2.17 (Medicare local)	No GP or nurse
Service 2.18	Service doesn't undertake this role
Total number	*18*
% of all Group 2 services	*19.8*

2.4 Services with ongoing data quality issues

More detailed analyses of the 15 services that were issued with exception reports for all reporting periods confirmed many of the previous findings (Table 12). The analyses can be summarised as follows:

- Only 4 of the 15 used PEN CAT to extract their data, while 11 submitted their data manually.
- Only 1 used Communicare, with the remainder using various PIRS—3 used Chime, 2 used a combination of systems and 2 used Medical Director (with PEN CAT).
- Ten were smaller services with under 500 clients.
- The most common indicators that services had problems with were PI03 MBS Health assessments, PI07 MBS GP management plan and PI08 MBS Team Care Arrangement.

Table 12: Characteristics of services with exception reports in all reporting periods

| | | | | | Indicators affected | |
Service location	Remoteness	Type and size	PIRS used	PEN CAT used	In all rounds	In 4 (HfL) or 3 (Group 2) rounds
Group 1 HfL services						
Vic	Outer regional	ACCHO, small	Medical Director	Yes	PI03, PI07, PI08	
Qld	Very remote	Non-ACCHO, large	Ferret	No (Manual)		
WA	Outer regional	Non-ACCHO, med	Communicare	Yes		PI03, PI08
SA	Outer regional	Non-ACCHO, small	Not specified	No (Manual)	PI05	PI03, PI07, PI08, PI23
Group 2 services						
NSW	Major city	ACCHO, small	Chime	No (Manual)	PI03	PI09, PI16
NSW	Inner regional	ACCHO, med	Medical Director	Yes	PI03, PI07, PI08	
NSW	Inner regional	ACCHO, med	Zedmed	Yes	PI01	PI16, PI02, PI04, PI13
NSW	Inner regional	Non-ACCHO, small	Chime	No (Manual)		PI09
NSW	Inner regional	Non-ACCHO, small	Not specified	No (Manual)		
Vic	Inner regional	ACCHO, med	Best Practice	No (Manual)		PI03, PI12
Vic	Inner regional	ACCHO, small	TCM	No (Manual)	PI03, PI09, PI16	PI01
Qld	Very remote	ACCHO, small	Medical Director	No (Manual)	PI03	PI05, PI07, PI08, PI09, PI16, PI23, PI15, PI18
Qld	Very remote	Non-ACCHO, small	Not specified	No (Manual)		PI03, PI05, PI07, PI08, PI09, PI16, PI23
SA	Very remote	Non-ACCHO, small	Chime	No (Manual)		PI03, PI05, PI22
Tas	Very remote	ACCHO, small	Not specified	No (Manual)		PI05, PI07, PI08, PI23 PI18

Notes: Small services had <= 500 clients; Medium>500–2,000; Large >2,000

2.5 Northern Territory government services

The NT government services are a special group as they report together as one group and have unique features. They share a common PIR system and the services provided to clients at services where they are visitors can be reallocated to their home clinic records. This means they will be counted as regular clients who received services at their home clinics in the nKPI

data collection. Reporting for all services is handled by the NT Department of Health in Darwin.

The NT Government services did not participate in the nKPI collection in 2012 and in 2013 they submitted data directly to the AIHW. In June 2014, the NT Government services made their first submission electronically through OCHREStreams. While these services have had some issues providing valid data for each of the three periods they have reported and the data have improved over time. These services are not included in the tables in this report because of their unique features.

The NT Government initially reported as a group of 29 services in June 2013, which increased to 32 services by June 2014. In the first data submission in June 2013 the NT Government did not meet the data transmission specifications for the nKPI collection, as it was provided in an incompatible file structure. For the December 2013 period, there were validation issues that required multiple resubmissions for all services. The June 2014 period had no initial validation issues, but when the data were compared to the previously submitted indicators some queries were raised regarding the validity of data which led the NT Department of Health to ask permission from the Commonwealth Department of Health to resubmit all June 2014 data.

The NT recording system

PCIS is a web-based system that enables health care workers to log onto the system from anywhere in the NT. Based on the profession, the level of details of patients that can be accessed is determined. For example, a receptionist will only have access to the basic information of a patient to manage appointments, while a GP will have access to a broader range of clinical information to enable better patient care. Each person with access will add relevant information to a patient record as they provide necessary services. As each person on PCIS has a unique hospital registration number (HRN) the relevant record for a person can be accessed from any location and regardless of where a patient is receiving a service, the information will be saved to the patient's record.

Data are extracted from PCIS to the central repository (NT Department of Health data warehouse) and the data manager then sets up a primary health care dataset for deriving data for nKPIs. Through shared electronic data system, patient demographic data held in the warehouse can be validated against the NT hospital separations data. The hospital data record is only a passive record that can be viewed but clinical data from these cannot be used for reporting purposes.

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3. Discussion

This analysis provides some insight into the characteristics of services that have data issues; the trends in and the reasons for exception reports, and the indicators affected. The analyses showed that Group 1 HfL services have fewer data issues with a trend of decreasing numbers of exception reports over time. Most of these fit the standard ACCHO model of a stand-alone primary health care service that delivers a full suite of services to Indigenous clients. These services have been reporting data since 2007 and most would have a single PIRS from which they extract data for reporting.

The services that have joined the collection from December 2012 onwards are less likely to fit this standard ACCHO model, and those that don't—like the 97 Group 2 services reporting in June 2014 and the 32 NT Government services—resent various challenges for the nKPI data collection. The NT Government services, for example, have a very different type of recording system, while the proportion of those Group 2 services that require exception reports is much greater than Group 1 services. The analyses showed that Group 2 services have data issues for a range of different reasons. But services with data issues are more likely to be smaller services, to have a PIRS that is not highly compatible with the system used to extract data and to submit through manual forms.

In addition, while we know that there are a number of these services that do not provide the full range of primary health care, they are still required to report on the full suite of indicators. Mothers and babies services, for example, generally do not provide health care for chronic conditions. But these services are still required to report denominator data by age and sex for the chronic disease indicators if they have clients who meet the denominator definition. This increases the likelihood of these services being issued with an exception report if these denominators are inconsistent with other related indicators.

Improvements to the data collection to reduce the number of exception reports will require a range of responses to address the different issues identified. But this analysis suggests that adding more flexibility to the system to cope with different types of services is likely to reduce data issues. This will be increasingly important as state-based services—whose model of care may differ considerably from the standard primary health care model—are introduced into the collection. It is also important for future expansion of the collection, as the addition of new indicators leads to increasing numbers of exception reports.

The analysis also has implications for the way that we currently report national data. The differences in the models of care and the structures of reporting systems, which are likely to become increasingly diverse in the future, suggest that national data would be more meaningful and useful if it were reported by grouping similar types of services.

Options for future consideration

A range of responses are suggested to improve the data collection process and reduce the number of exception reports. Some of these could be implemented quite quickly and easily, and some will require greater costs and longer time frames. Further consideration of these options is required before any changes are implemented.

1. Introduce more validation of data at the service level before submission to AIHW

Validation checks were the main reason that 28 of the 59 services were issued with an exception report in June 2014. Validation issues also frequently lead to services getting more than one exception report in the reporting period. The number of these reports could be reduced if more validation issues were sorted out before the data are submitted to AIHW.

This could be achieved through the following measures:

- Promotion of the AIHW user guide, and the development of a one page checklist to assist services to identify major issues before submitting their data.

- More training and education of service providers to encourage them to review and check their data before submitting it to AIHW—for example, when their nKPI files are populated at OCHREStreams from the PEN CAT extract. This analysis has shown that many services are aware of issues with their data and request an exception report to correct it, but if they could correct their data before submitting it, the data collection process would be quicker.

- Providing targeted training to services as to what should be included in their submission and how to check their data. This could be done through an annual workshop for all services, as well as through a targeted strategy of face-to-face visits at services that have ongoing issues with their data submissions.

The extent to which these measures would reduce exception reports is hard to estimate as it is dependent on how well services respond to them. But they could potentially reduce the number of exception reports by 30–40%.

2. Address known issues in relation to software and data extraction

There are known issues with some software that cause ongoing problems that haven't been addressed. All 11 services using the electronic system MMEX were issued with an exception report as this system is not compatible with PEN CAT. In addition there were another 7 services in June 2014 where the main reason for an exception report was PEN CAT issues.

In addition, services that provide manual submissions have a high rate of data issues. More assistance in completing the data collection could be provided to these services.

Addressing these issues could reduce the number of exception reports by around 10 to 20%.

3. Increase flexibility in the nKPI system through adoption of a module-based system

Many of the new services that are contributing to the nKPI collection don't fit the ACCHO primary health care model, but they are asked to provide data on the full suite of indicators (either zeros or client numbers by age and sex in the denominator). The data collection process could be improved by asking services to only report on health services that they are funded to deliver. This could be done through the introduction of a module-based system, similar to the Online Service Report (OSR) data collection, so that services would only be asked to provide data for indicators that are applicable to their service.

The system could, for example, include the following three modules with the relevant indicators mapped to these. The services are required to complete only those modules relevant to their service delivery model:

- maternal and child health
- preventative health
- chronic disease management.

In order to develop this type of system, it would be important to understand more about the different types of organisations and the health services they are funded to deliver. The AIHW is currently analysing both OSR and nKPI data in order to better understand which services don't provide the full suite of primary health care that the nKPI seeks to capture. Information from the Department of Health about what services are funded to deliver would assist this analysis.

Using this approach, stand-alone maternal and child health services would be asked to provide data for this module only and would not be asked to provide any denominator data on the chronic disease indicators if they don't provide these services. This would reduce the potential sources of validation error and, therefore, the number of exception reports. As part of this process, consideration could also be given to what data should be provided by organisations that don't directly deliver health care, such as Medicare Locals.

In the short term, this issue could be partly addressed by not requiring services to provide any data, or allowing them to provide NA (not applicable) for indicators on health services that their organisation doesn't provide. This is likely to be a low-cost solution that could be implemented comparatively quickly. Services can currently be issued with an exception report for an indicator of a health service they don't provide if the denominator they provide (for example, the number of regular clients by age and sex) is not consistent with other indicators.

There are some 20 to 30 services that are likely to directly benefit from a module-based approach, not including the state based services. In the long term this approach could reduce the number of exception reports by around 30%.

This solution would also provide the AIHW with better insight into similarities and differences between organisations' service models. This could further increase sophistication of nKPI data analyses that would better inform policy.

Appendix 1: Example section of an exception report

Note: Following is a section of an exception report provided to services. This example includes the data that the service provided for Indicator Group 1 (shaded in pink). The numbers by age group should be consistent, but they are not. The issues with the data are outlined in the comments section. Cells coloured green with ticks have been opened up to allow services to manually correct the data.

30/06/2014 - 31/07/2014 National Key Performance Indicators (National Key Performance Indicators) - Exception Report 1, Indicator Group 1

Comments: The total number of clients in PI03 - Health assessments aged 25 and over, PI09 - Smoking status and PI16 - Alcohol consumption (denominators) should all be the same. This is not the case for males aged 15–24, 25–34, 35–44, 45–54, 55–64 and 65 and over and for females aged 15–24, 25–34, 45–54, 55–64 and 65 and over. If you have any questions regarding this issue, or completing the exception report, please contact the AIHW (Canberra, ACT) by email: dataquality@aihw.gov.au or by phone 1800 723 258. Please correct your data and submit it to the AIHW within 2 weeks. With thanks, AIHW data quality helpdesk.

PI03: Indigenous regular clients who received an MBS Health Assessment for Aboriginal and Torres Strait Islander People (MBS Item 715)

Numerator

Number of Indigenous regular clients who received an MBS Health Assessment for Aboriginal and Torres Strait Islander People (MBS item 715) within the previous 12 months (aged 0–4 years) and within the previous 24 months (aged 25 and over)

0–4 years	0

	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	1	0	3	2	1
Female	1	0	2	2	3

Denominator

Total number of Indigenous regular clients

0–4 years	0

	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	✔ 1	✔ 0	✔ 3	✔ 2	✔ 1
Female	✔ 1	0	✔ 2	✔ 2	✔ 3

PI09: Indigenous regular clients whose smoking status has been recorded

Numerator

Number of Indigenous regular clients aged 15 and over whose smoking status had been recorded

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	1	4	2	5	4	3
Female	3	2	0	6	7	5

Denominator

Total number of Indigenous regular clients aged 15 and over

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	✔ 1	✔ 4	✔ 2	✔ 5	✔ 4	✔ 3
Female	✔ 3	✔ 2	0	✔ 6	✔ 7	✔ 5

PI16: Indigenous regular clients whose alcohol consumption status has been recorded

Numerator

Number of Indigenous regular clients aged 15 and over who had their alcohol consumption status recorded within the previous 24 months

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	0	4	1	4	6	2
Female	0	3	0	2	6	5

Denominator

Total number of Indigenous regular clients aged 15 and over

	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
Male	✔ 0	✔ 4	✔ 1	✔ 4	✔ 6	✔ 2
Female	✔ 0	✔ 3	0	✔ 2	✔ 6	✔ 5

References

Australian Institute of Health and Welfare 2014. National key performance indicators for Aboriginal and Torres Strait Islander primary health care: results from December 2013. National key performance indicators for Aboriginal and Torres Strait Islander primary health care series. Cat. no. IHW 146. Canberra: AIHW.

List of tables

The AIHW collects data against a set of national Key Performance Indicators (nKPIs) from primary health care organisations that provide health care to Aboriginal and Torres Strait Islander Australians. The nKPI data are collected every 6 months, reported back to organisations at the individual service level and compiled for national reporting purposes. The raw data received from health organisations are carefully checked to identify any data quality issues and are corrected, in consultation with services, through an 'exception reporting' process before the data are used in any type of reporting.

This working paper identifies the most common data quality issues that lead to the issuing of exception reports, and suggests a number of options to improve the data collection process that will reduce the number of exception reports issued.