Priority Evidence-Practice Gaps in Aboriginal and Torres Strait Islander Acute Rheumatic Fever and Rheumatic Heart Disease Care

Data Supplement – Final Report:

Phase 1 Current Status Data (2012-2014)

Phase 2 Trend Data (2008-2014)

Engaging stakeholders in identifying priority evidence-practice gaps and strategies for improvement in primary health care (ESP project)

To be read in conjunction with the Acute Rheumatic Fever and Rheumatic Heart Disease Care Final Report

Bailie J, Matthews V, Laycock A, Bailie R. Aboriginal and Torres Strait Islander Acute Rheumatic Fever and Rheumatic Heart Disease Care: Final Report, ESP Project, Menzies School of Health Research. November 2016.

Table of Contents

The ABCD National Research Partnership is led by Menzies School of Health Research and funded by the National Health and Medical Research Council (ID No.545267) and the Lowitja Institute. The Partnership includes Aboriginal Community Controlled Health Organisation peak bodies and members services, government health departments, academic institutions, and primary health care services in five states and territories: the Northern Territory, Queensland, South Australia, Western Australia and New South Wales. Ethical approval has been granted by the Human Research Ethics Committees in all jurisdictions where there are participating health services.

1 Phase 1 data report – identifying priority evidence-practice gaps

Forty-four health centres last used the ARF/RHD audit tool in 2012, 2013 or 2014 (Table 1) and the health centres had used the audit tools for varying numbers of cycles (Table 2). The ARF/RHD audit tool had been used mostly by health centres in QLD and the NT where the disease is known to be prevalent. The data included in the analysis for this report were extracted in July 2014. A total of 897 records were audited at the 44 health centres. Nine health centres last used the ARF/RHD tool in 2012 (170 records audited), 26 health centres in 2013 (468 records audited) and 9 health centres in 2014 (259 records audited). To date, 22 of these health centres recorded a completed systems assessment in the One21seventy database.

Table 1 Most recent RHD audit and systems assessment completed in 2012, 2013 or 2014 (number of client records audited, number of health centres)

		2012	2013	2014	Total
QLD	#Records	124	196	19	339
	#Centres	7	16	1	24
	#SATs	3	13	0	16
NT	#Records	46	272	240	558
	#Centres	2	10	8	20
	#SATs	1	4	1	6
Total	#Records	170	468	259	897
	#Centres	9	26	9	44
	#SATs	4	17	1	22

Table 2 Most recent AFR/RHD audit completed, by audit cycle in 2012, 2013 or 2014 (number of health centres)

	Last Audit Cycle Completed						
	1	**2**	**3**	**4**	**5**	**6**	**Total**
QLD	6	5	9	3	1	0	24
NT	9	6	1	0	2	2	20
Total	15	11	10	3	3	2	44

The majority of audited health centres are in remote communities (84%) and are government managed (87%). Half of the communities served by these health centres have a population greater than 1000 people while 29% have populations less than 500 (Table 3). Ninety-five percent of records audited were for Aboriginal or Torres Strait Islander clients. Nearly half of all records were for clients classified as Priority 3 (Mild RHD or ARF only and no RHD). Priority 1 (Severe RHD) and Priority 2 (Moderate RHD) client groups made up 20% each. Close to 100% of audited records showed a record of attendance at the health centre either within the previous 6 or 12 months depending on RHD classification and almost half of these attendances were to receive regular benzathine penicillin injections. National data shows that initial assessment at the health centre was most commonly

conducted by a nurse, with General Practitioners and Aboriginal or Torres Strait Islander Health Workers (ATSIHWs) being the next most common professionals to do the initial assessment.

Table 3 Characteristics of health centres and clients whose records were last audited during 2012-2014 (number & %)

		QLD		NT		Total	
	Primary Health Care Centres	**24**		**20**		**44**	
Location	Urban	1	4%	1	5%	2	7%
	Regional	3	13%	1	5%	4	9%
	Remote	20	83%	18	90%	38	84%
Governance	Government	24	100%	14	70%	38	87%
	Community Controlled			6	30%	6	13%
Size of population served	≤500	11	46%	2	10%	13	29%
	501-999	4	17%	5	25%	9	20%
	≥1000	9	37%	13	65%	22	51%
Completed RHD audit cycles	Baseline	6	25%	9	45%	15	33%
	1-2 cycles	14	58%	7	35%	21	49%
	≥3 cycles	4	17%	4	20%	8	18%
	Number of audited records	**339**		**558**		**897**	
	Age (mean & range)	24	(2-75)	30	(3-78)	28	(2-78)
Gender	Males	132	39%	226	41%	358	40%
	Females	207	61%	332	59%	539	60%
Indigenous status	Indigenous	302	89%	554	99%	856	95%
	Non-indigenous	5	1%	4	1%	9	1%
	Not stated	32	9%			32	4%
Reason for last attendance	BPG Injection	195	58%	227	41%	422	47%
	Oral antibiotic prophylaxis	1	0.3%	8	1%	9	1%
	Acute care	78	23%	130	23%	208	23%
	Well person's check	4	1%	23	4%	27	3%
	Specialist review	14	4%	15	3%	29	3%
	Other	47	14%	155	28%	202	23%
Profession client first seen by	ATSIHW	27	8%	89	16%	116	13%
	Nurse	257	76%	362	65%	619	69%
	GP	45	13%	70	13%	115	13%
	Specialist	7	2%	14	3%	21	2%
	Allied Health	1	0.3%	6	1%	7	1%
	Other			17	3%	17	2%
	Not stated	2	0.6%			2	0.2%
RHD Classification	Priority 1: Severe	35	10%	142	25%	177	20%
	Priority 2: Moderate	64	19%	115	21%	179	20%
	Priority 3: Mild, ARF (no RHD)	194	57%	247	44%	441	49%
	Unable to determine	4	1%	13	2%	17	2%
	Not recorded	42	12%	41	7%	83	9%
Time since last attendance	Within past 6 months (priority 1 & 2)	95	96%	250	97%	345	97%
	Within past 12 months (priority 3)	190	98%	245	99%	435	99%

1.1 Identifying priority evidence-practice gaps

The priorities for improvement, or priority evidence-practice gaps, reported here were determined by identifying items in the national clinical audit and systems assessment data that reflected:

a. basic aspects of clinical care that were being delivered and recorded at a high level of performance by the majority of services, but that were being delivered at a much lower level by a proportion of services;

b. aspects of care where there was more general wide variation in recorded delivery of care;

c. important aspects of comprehensive PHC that were generally recorded at low levels; and,

d. components of PHC centre systems that were relatively poorly developed.

These criteria were used by the ABCD Project team to identify a preliminary set of priorities. The preliminary priorities are presented in the body of the report, and are also presented below for summary purposes.

Key information in client records/health summaries

Improve recording of key client information across the scope of indicators of best practice, with a specific focus on the following:

a. Improve levels of recording ARF diagnoses (including suspected ARF)

b. Support health centres at the lower end of the range to improve recording of RHD classification

c. Support health centres at the lower end of the range to prioritise disease management planning

d. Improve identification of Priority 1 clients waiting for cardiac surgery, and warfarin prescriptions for clients where indicated.

Penicillin use and recurrent rheumatic fever

a. Improve recording of key information related to delivery of BPG injections, with a specific focus on supporting health centres at the lower end of the range to improve recording of planned frequency of BPG injections, particularly on current prescription and clinic master chart

b. Increase uptake of planned BPG injections to 80% or more for all clients who are prescribed injections

c. Strengthen activity around follow-up of clients who received less than 80% of planned BPG injections within a 12 month period, and focus these efforts specifically on improving coverage in follow-up clients and recording of specific follow-up strategies

d. Strengthen efforts to provide interventions for clients who have ARF despite adequate injection delivery.

Scheduled Services

Ensure timely medical care across the scope of indicators of best practice, with a specific focus on the following:

a. Support health centres at the lower end of the range to improve doctor and specialist review and recording of echocardiogram, as indicated for clients according to level of disease.

b. Explore and address factors contributing to the low levels of documentation for dental services

Risk factors and interventions

- Support health centres at the lower end of the range to improve the practice and documentation of risk factor identification and intervention, and standardise the practice and recording of rheumatic fever education for all clients.

1.2 Presentation of audit data: horizontal box and whisker plots

The presentation of audit findings follows the structure of the RHD audit tool, with sections on recording of key client information; documented penicillin use; recurrence of acute rheumatic fever and follow-up; scheduled services; and risk factors and brief interventions.

Each section of the report includes:

- A summary of key findings from the national audit data;
- Preliminary priority evidence-practice gaps (preliminary priorities for improvement) based on the national data; and
- Box and whisker plots for each of the items in the audit tool, which show the level of adherence to best practice guidelines, and variation between health centres.

Box and whisker plots

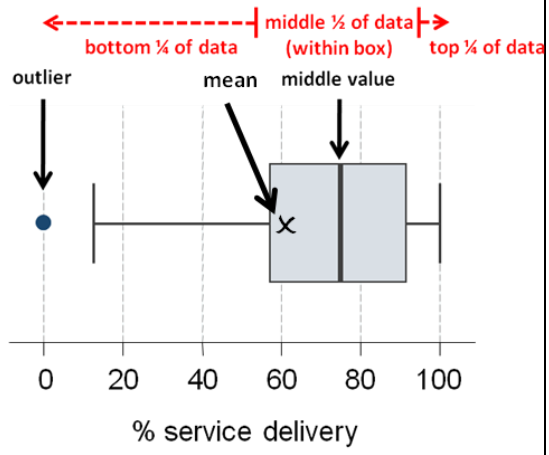
The mean percent delivery of each service item is calculated for each health centre and displayed within a 'box and whisker plot' to show the distribution (or variation) in delivery of that item across health centres.

Box and whisker plots show (Box 2):

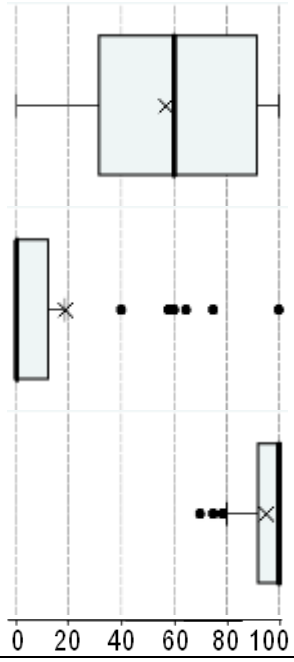
- the minimum and maximum values (ends of whiskers if no outliers);
- outliers which are values far away from most other values in the data set (or a distance that is greater than 1.5 times the length of the box);
- the range of service item delivery by dividing the dataset into quarters:
    - the box represents the middle 50% of the dataset, and the line within the box represents the median (or middle value);
    - the right hand whisker (and outliers if present) represents the top 25% of the data
    - the left hand whisker (and outliers if present) represents the bottom 25% of the data; and
- the longer the box plot, the greater the range (or variation).

Box 1. How to interpret box and whisker plots

Interpretation:



Examples:



- Wide variation in service delivery (range 0-100%).
- Health centres relatively equally dispersed across the range. 25th to 75th centile is 30-90%.

- Majority of centres at lower end of range (between 0-20%) with a few health centres at higher levels – up to 100%.

- Smaller variation in service delivery (range 70-100%).
- All centres at higher end with 75% of centres in the 90-100% range.

1.3 Client records & health summaries

The figures in this section show mean health centre percentages of ARF/RHD clients who have a record of key information in medical records such as diagnosis and RHD classification, current management plans, risk factor status and relevant information about surgery history and medication prescriptions.

Figure 1 **Mean health centre percentages of ARF/ RHD clients with a record of diagnosis in health summaries or elsewhere in the medical record and documentation of RHD classification and current management plans**

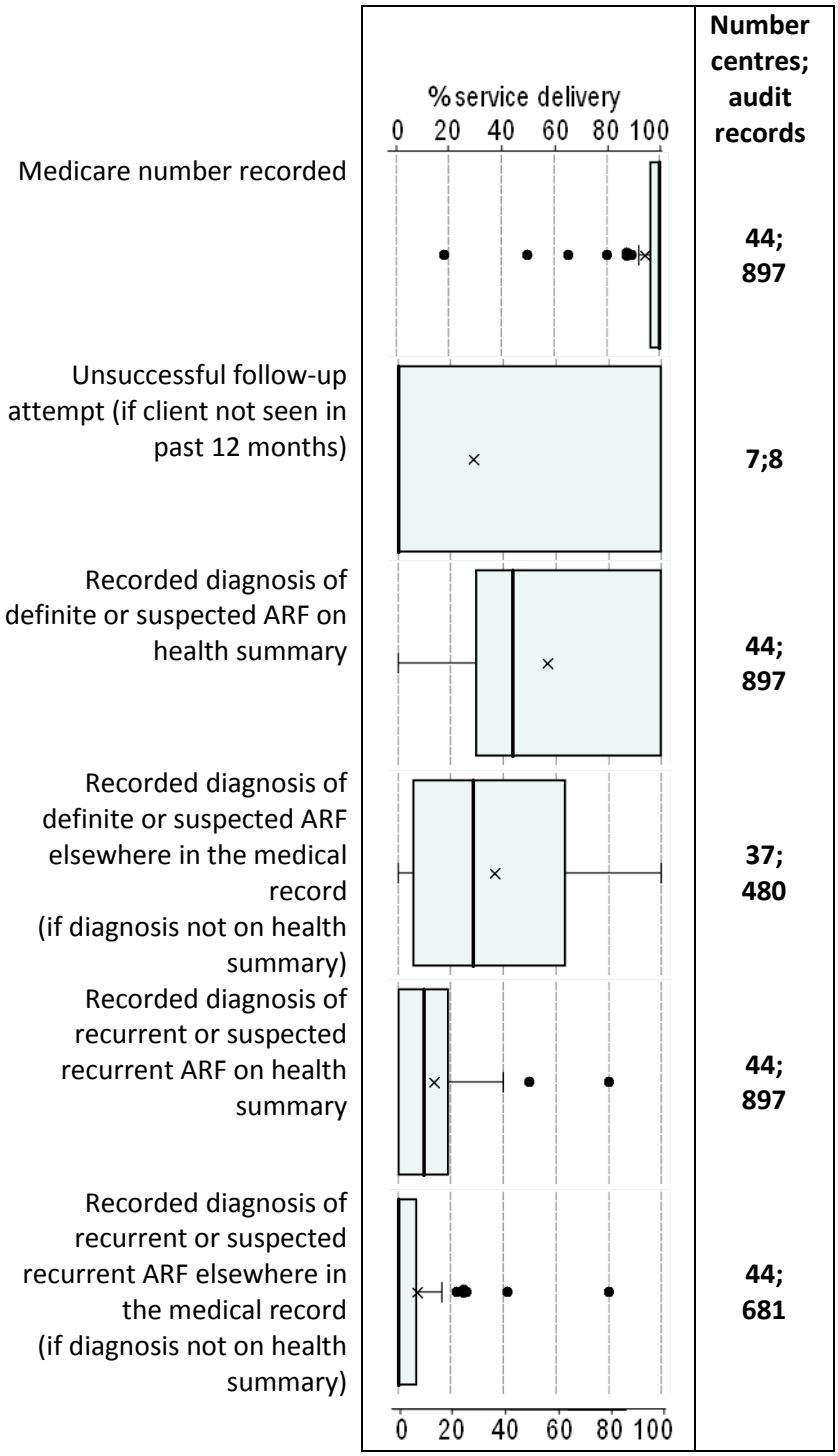


Figure 1. cont: **Mean health centre percentages of ARF/ RHD clients with a record of diagnosis in health summaries or elsewhere in the medical record and documentation of RHD classification and current management plans**

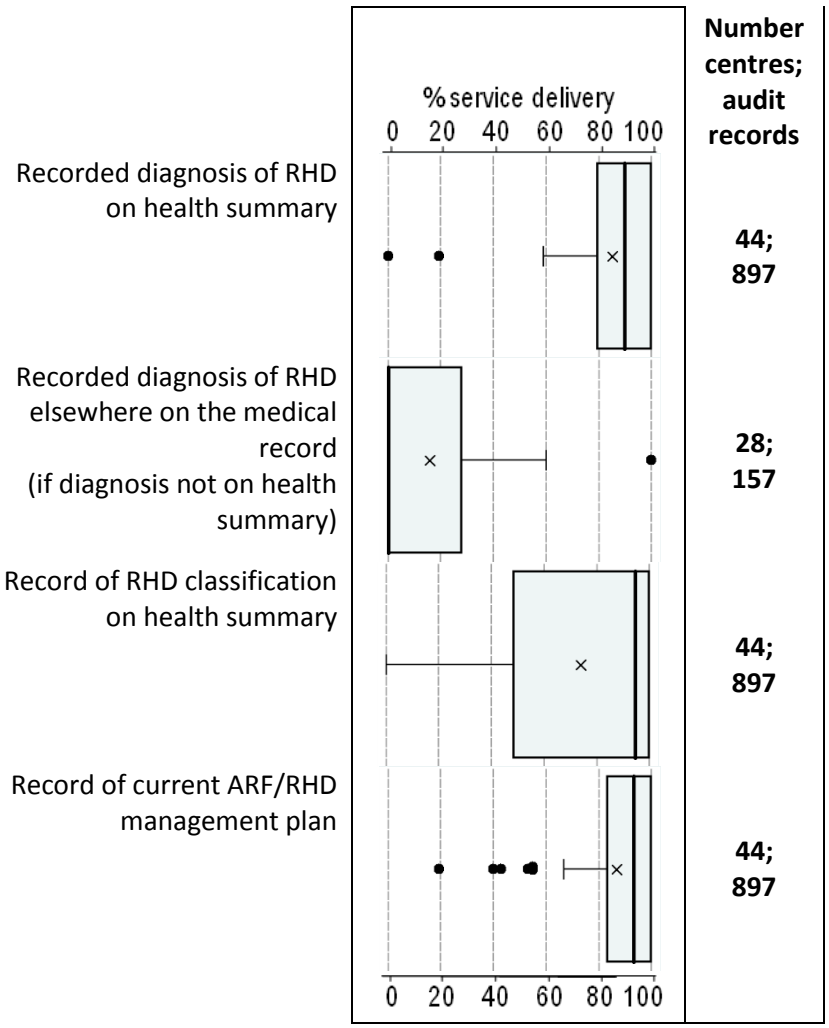
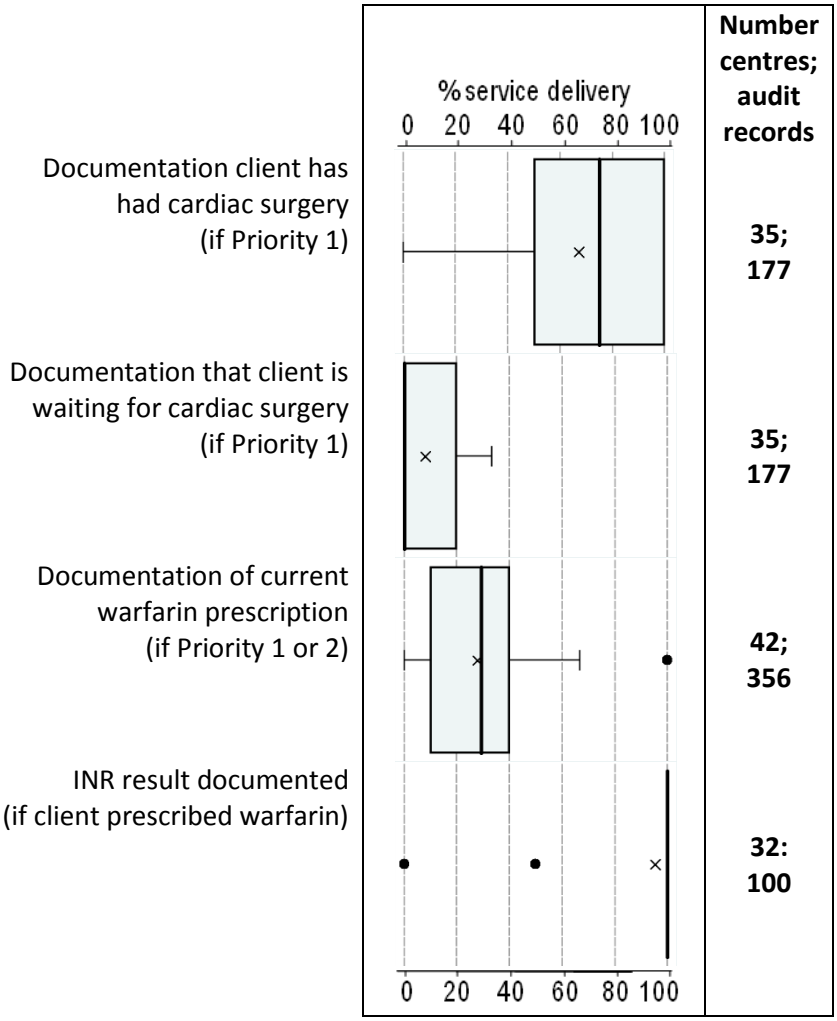


Figure 2 **Mean health centre percentages of ARF/RHD clients with documentation of relevant information on surgical history and warfarin prescription in the medical record**



1.4 Penicillin use and recurrent rheumatic fever

The figures in this section show mean health centre percentages of ARF/RHD clients with a record of: prescription of benzathine penicillin (BPG) injections (or oral prophylaxis); planned frequency of injections; follow-up action if <80% of planned injections received; and follow-up action if one or more episodes of recurrent ARF were recorded within the last 12 months.

Figure 3 **Mean health centre percentages of ARF/RHD clients with a record of prescription for BPG injections or oral prophylaxis and record of planned frequency of BPG injections in the medical record and/or clinic master chart**

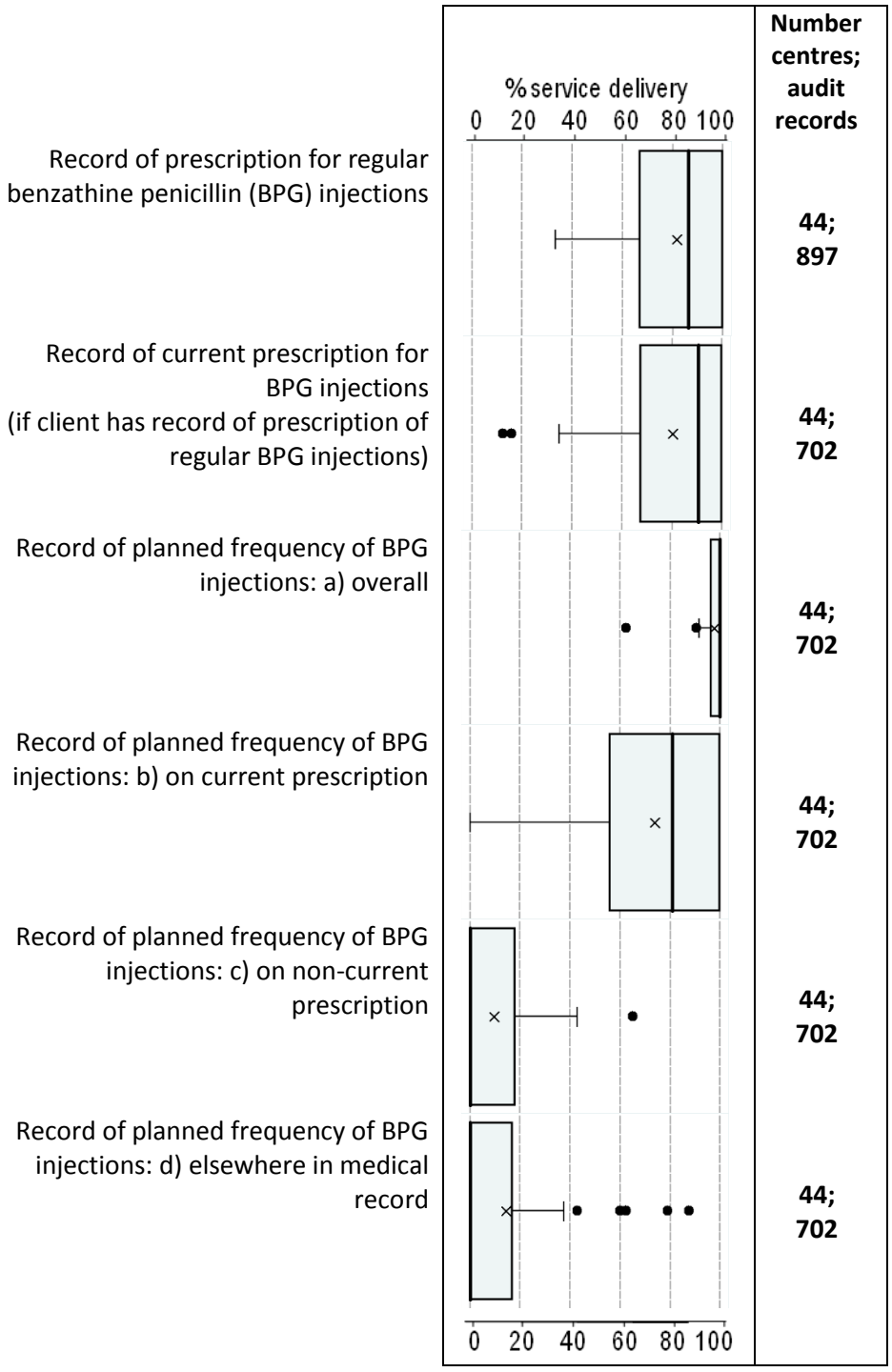


Figure 3 cont: **Mean health centre percentages of ARF/RHD clients with a record of prescription for BPG injections or oral prophylaxis and record of planned frequency of BPG injections in the medical record and/or clinic master chart.**

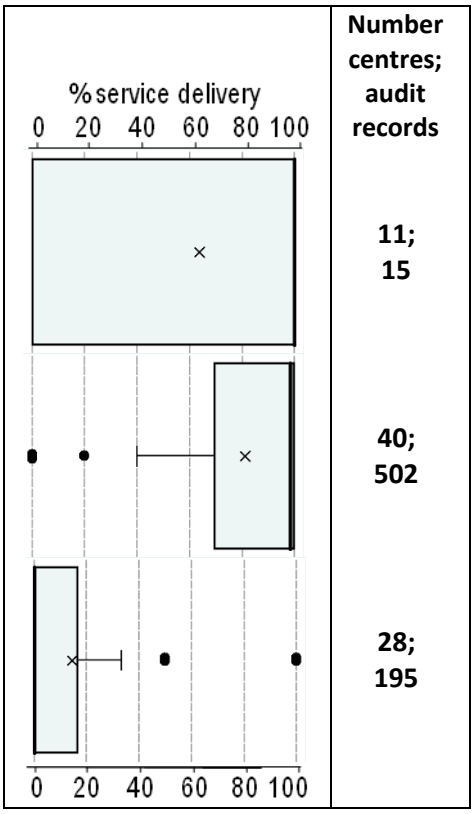


Figure 4 **Mean health centre percentages of ARF/RHD clients with a record of follow-up if percent of planned BPG injections received was less than 80%**

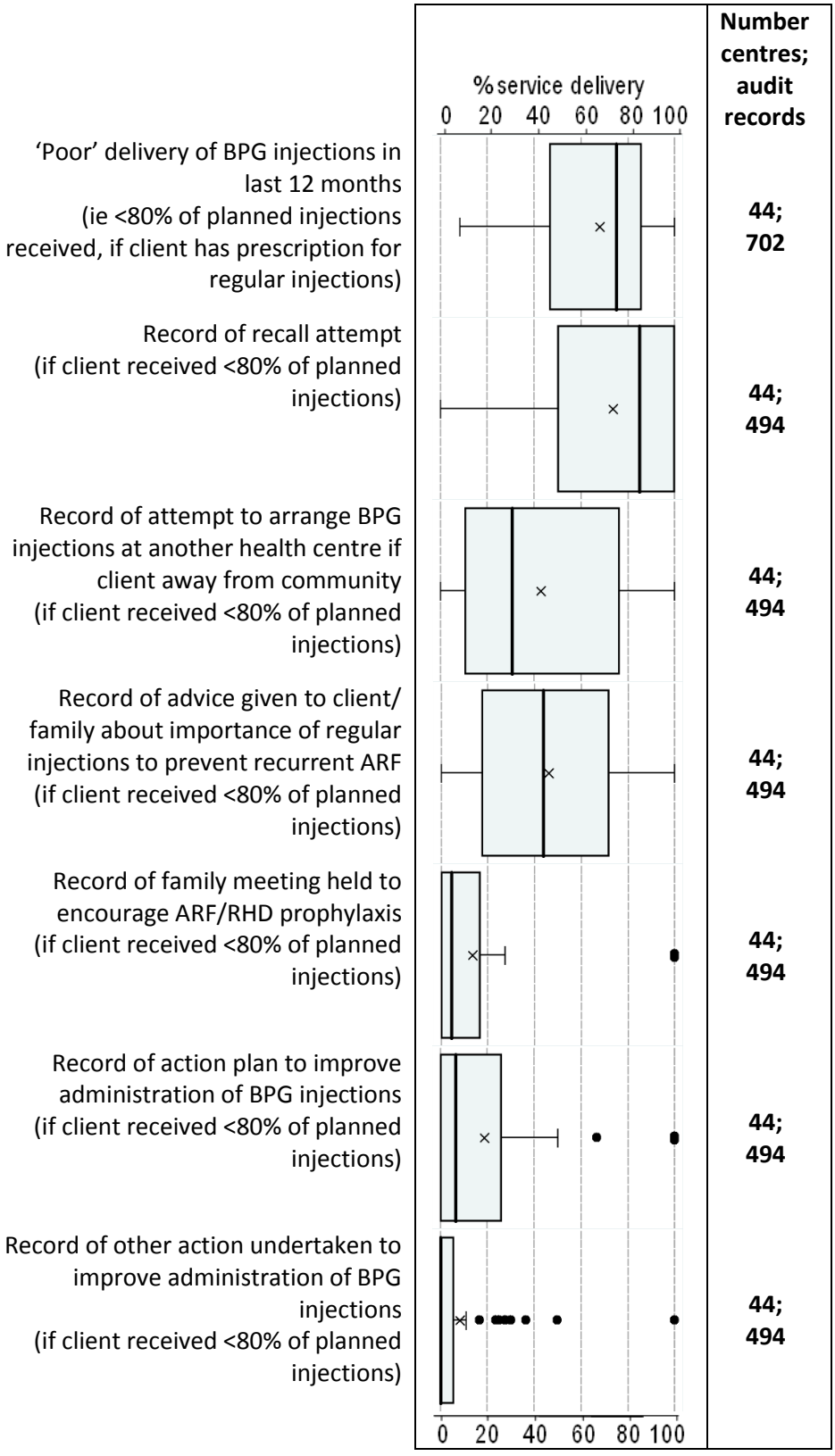
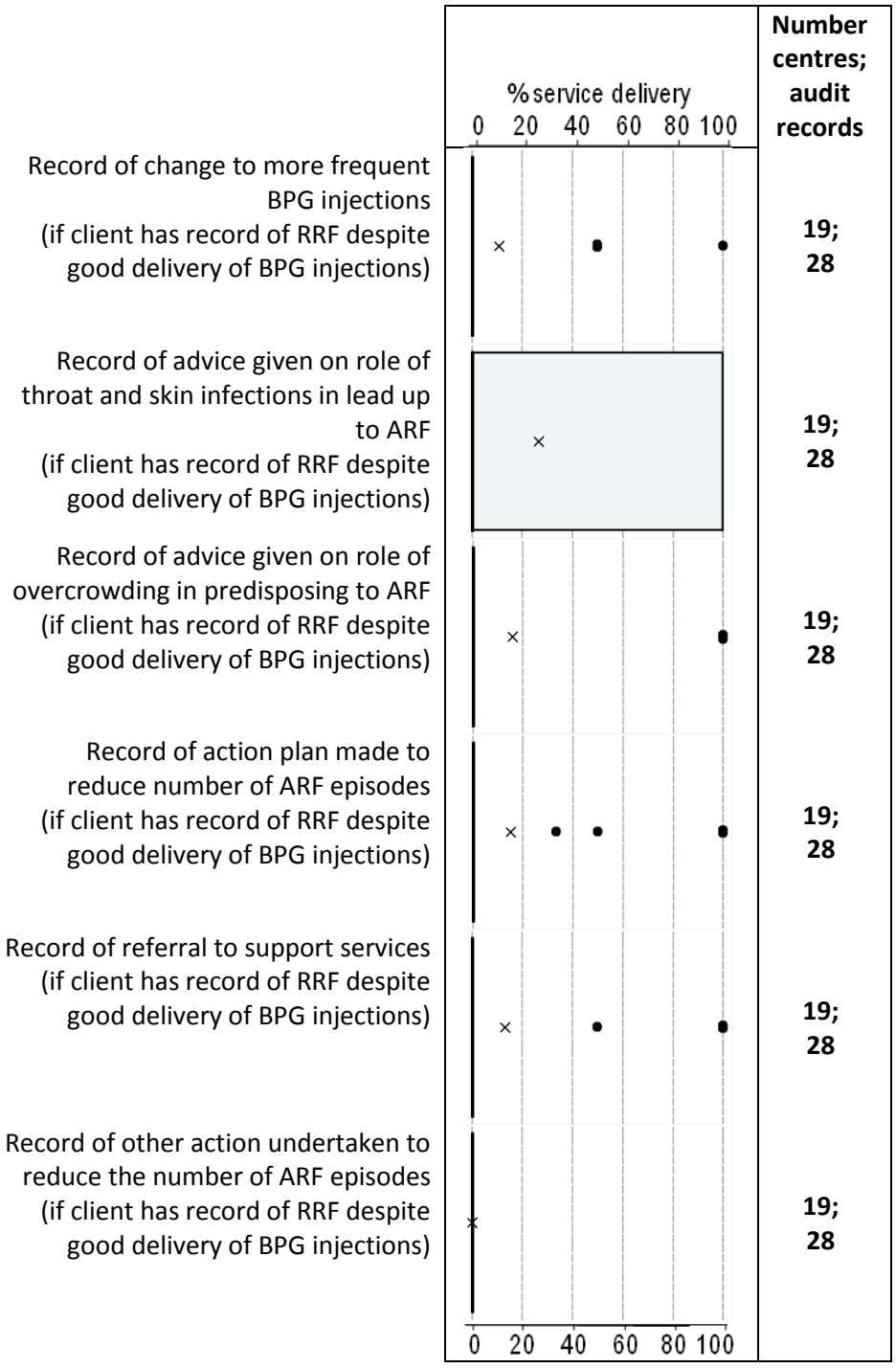


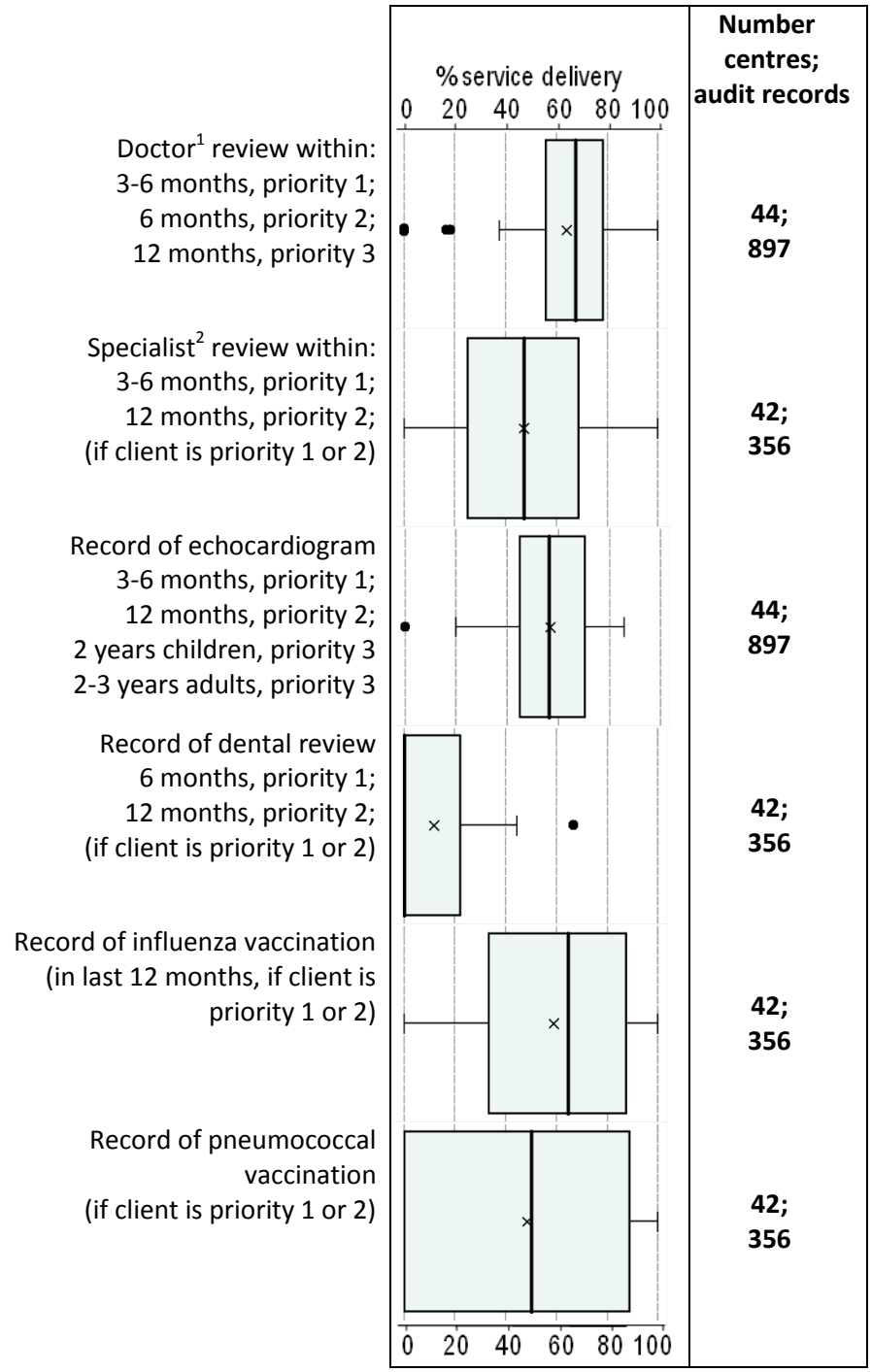
Figure 5 **Mean health centre percentages of ARF/RHD clients with a record of follow-up if one or more episodes of recurrent rheumatic fever (RRF) were recorded, despite good delivery of BPG Injections (≥80%) in the last 12 months**



1.5 Scheduled Services

The figures in this section show mean health centre percentages of ARF/RHD clients with a record of scheduled services received (as indicated depending on priority level), documentation of risk factors and brief interventions where relevant within the last 12 months.

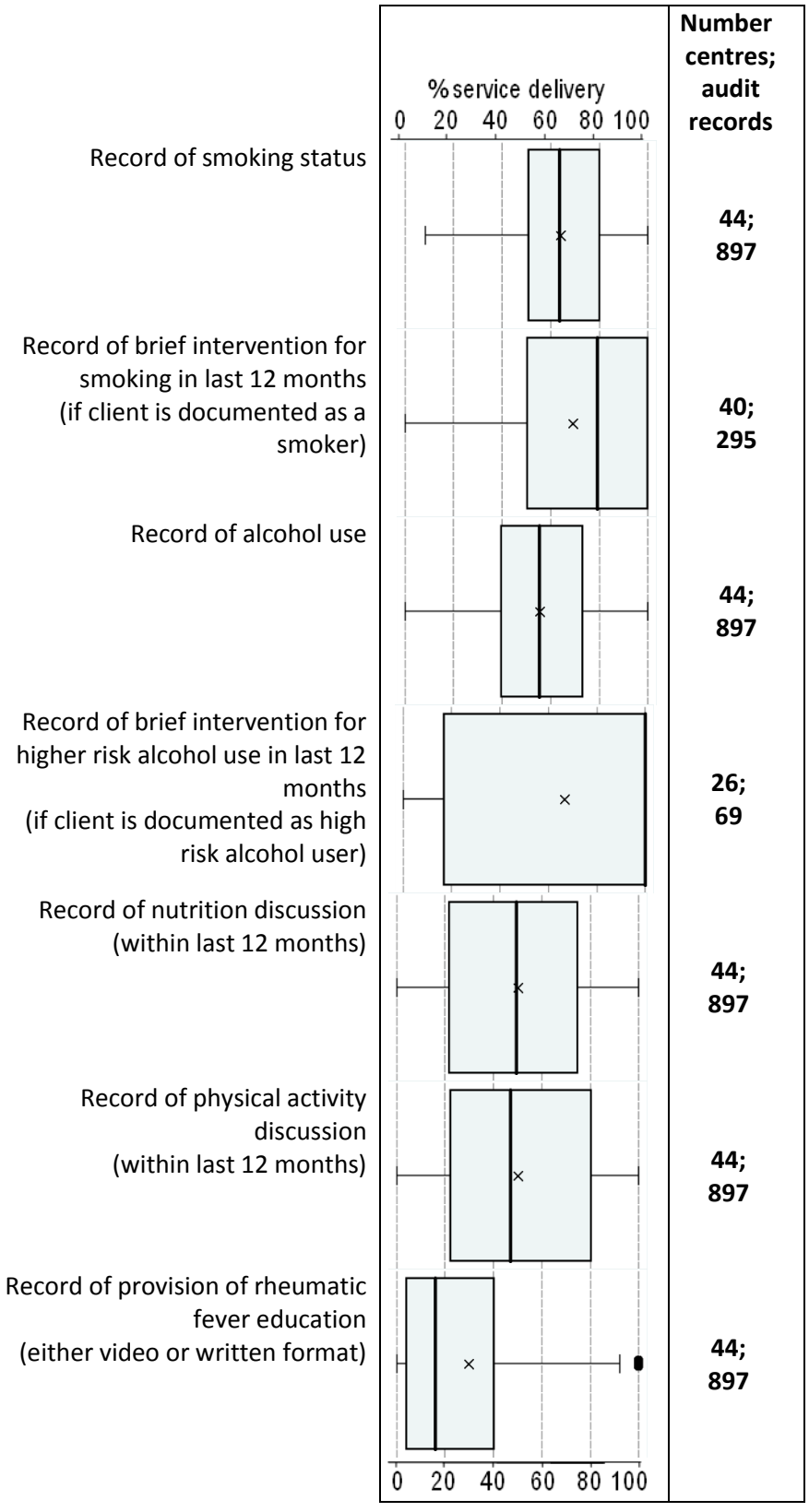
Figure 6 Mean health centre percentages of ARF/RHD clients with a record of scheduled service received within the timeframe recommended for the RHD classification as indicated



[1] Doctor may include local GP, visiting DMO, GP registrar or junior doctor
[2] Specialist may include cardiologist, physician, paediatrician or specialist registrar

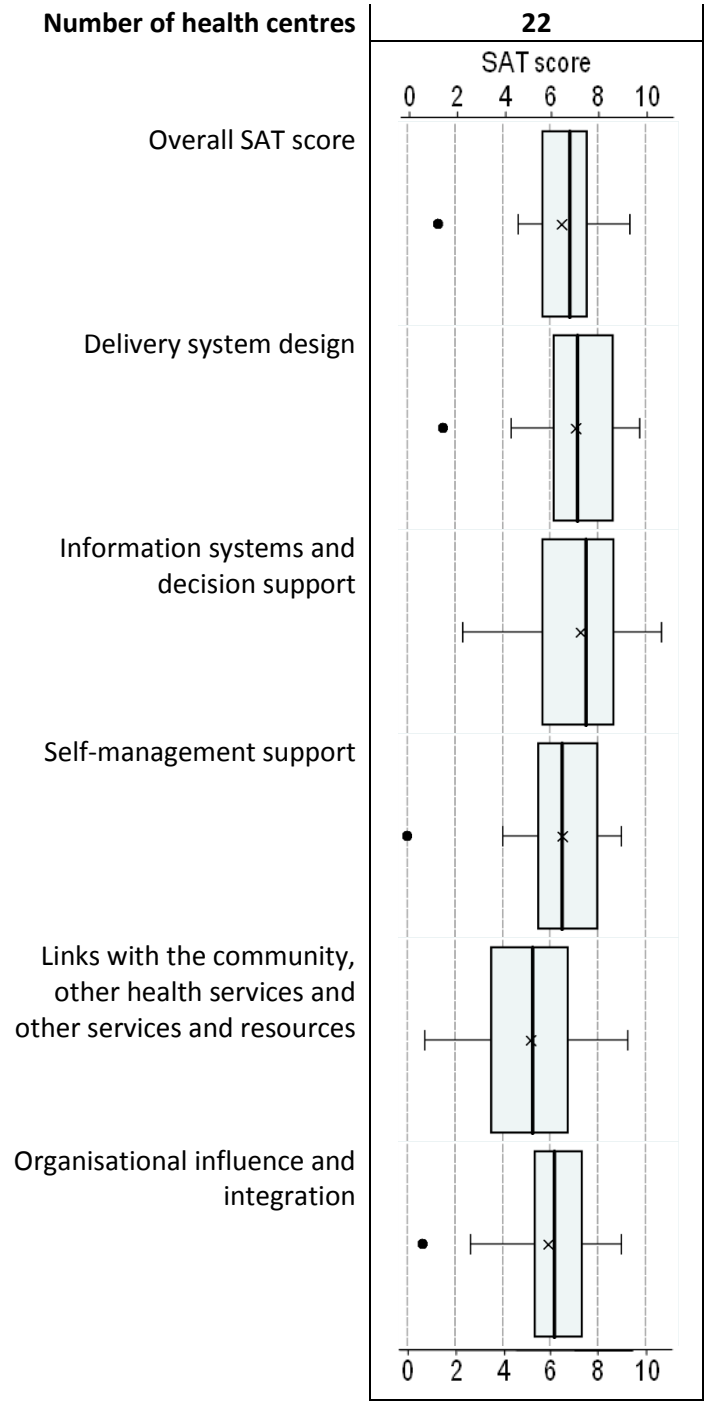
1.6 Risk factors and interventions

Figure 7 **Mean health centre percentages of ARF/RHD clients with documentation of risk factors and record of brief interventions provided where relevant**



1.7 Systems assessment findings

Figure 8 Mean system component scores as assessed by health centres



Scores for the individual items within each system component, aggregated for all health centres nationally, are shown in the figures below.

Figure 9 Delivery system design component scores as assessed by health centres

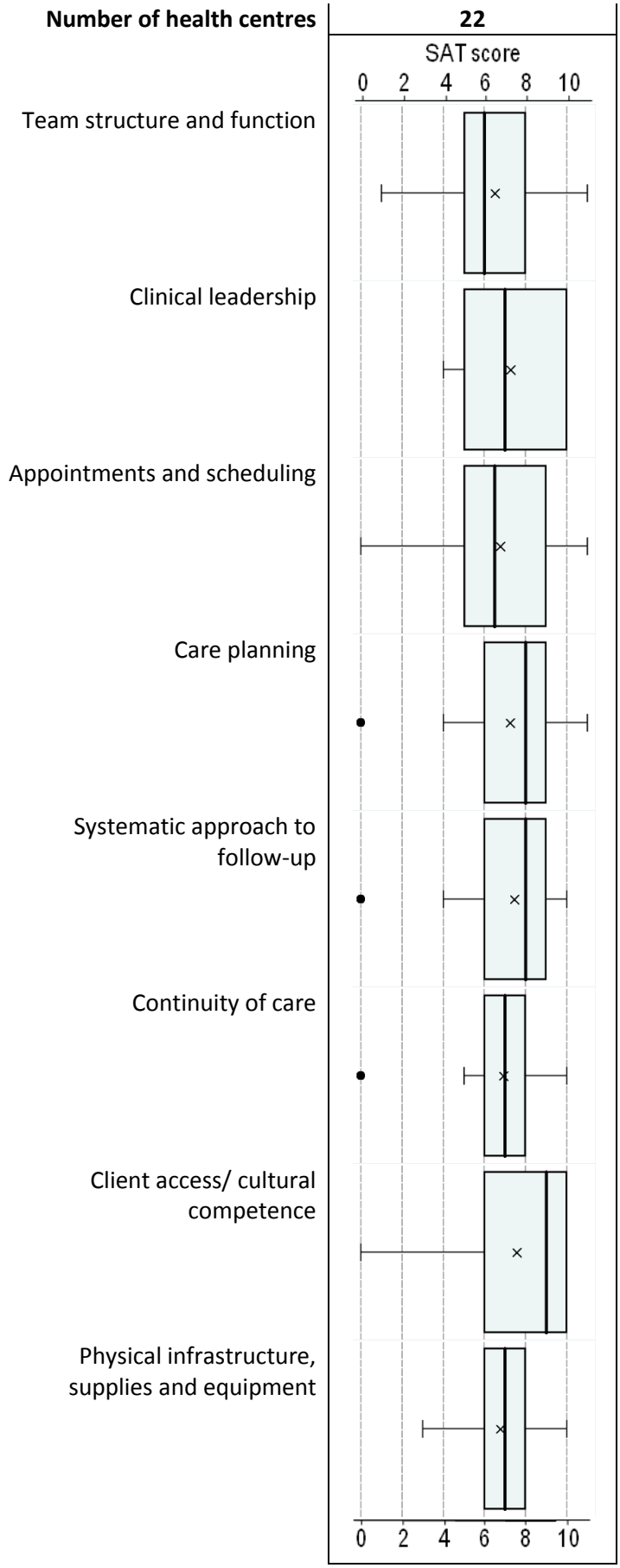


Figure 10 Information systems and decision support component scores as assessed by health centres

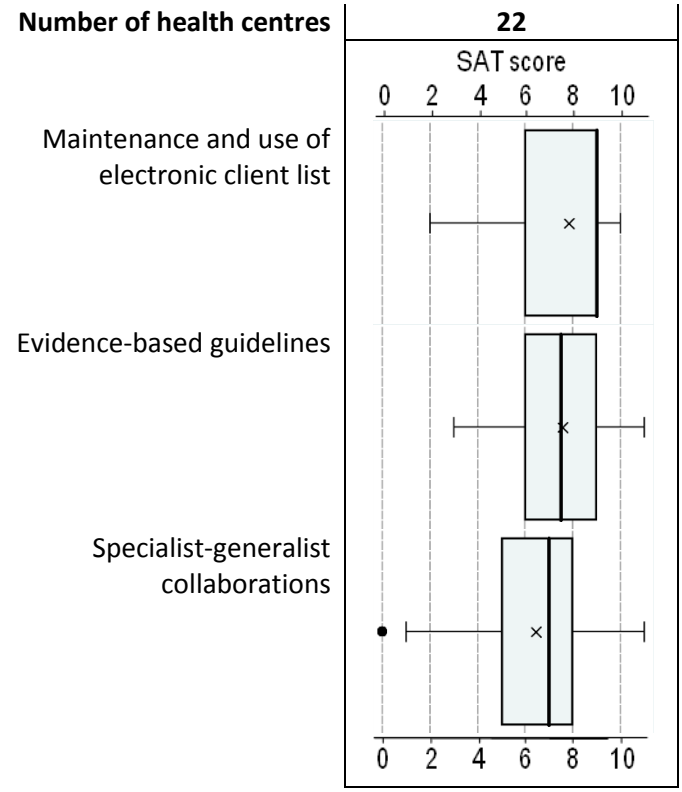


Figure 11 Self-management support component scores as assessed by health centres

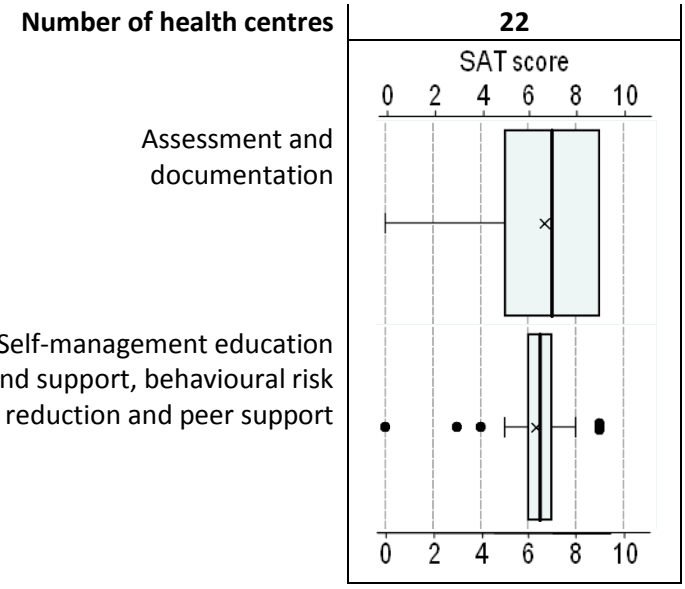


Figure 12 **Links with the community, other health services and other services and resources component scores as assessed by health centres**

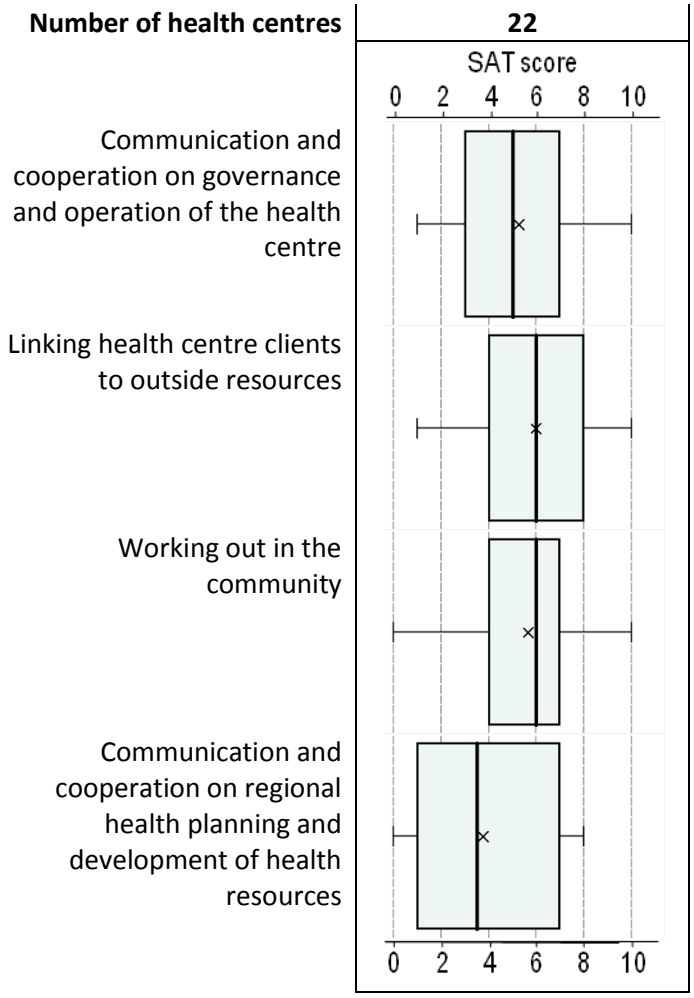
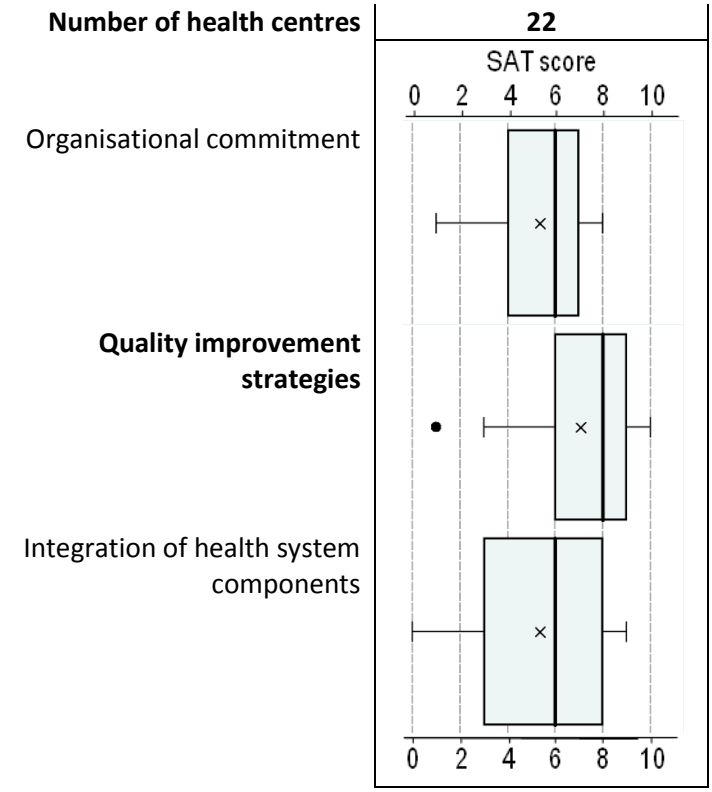


Figure 13 Organisational influence and integration component scores as assessed by health centres



2 Phase 2 data report – identifying barriers and enablers

Health centre characteristics

Sixty health centres conducted ARF/RHD audits between 2008 and 2014 auditing a total of 2,581 patient records.

The number of health centres using the ARF/RHD health audit tool increased from 7 in 2008 (184 records audited) to 35 (626 records audited) in 2013. The number declined to 10 health centres in 2014 (291 records audited) (Table 4).

There were 19 health centres that conducted at least three audit cycles, with a smaller number conducting four or more cycles (Table 5).

Overall, 88% (53/60) of health centres were in remote locations and 87% (52/60) were government managed (Table 6).

National data show that initial assessment at the health centre was most commonly conducted by a nurse (62%), with Aboriginal or Torres Strait Islander Health Professionals (ATSIHP) (20%), followed by GPs (12%) being the next most common professionals to do the initial assessment (Table 6). Presentation for a BPG injection was the main reason for last attendance (44%) followed by acute care (25%).

Patient characteristics

The data presented relate to aspects of care for patients of all ages with a suspected or definite diagnosis of ARF or a diagnosis of RHD. Excluded from the analysis are 'inactive' patients (RHD priority 4 classification) that had a history of ARF (no RHD) and for whom secondary prophylaxis has been ceased.

The majority of patients were female (62%), Indigenous (94%) and classified as priority 3 - ARF (no RHD) or mild RHD (41%). For priority 3 patients, almost all audited records showed a record of attendance at the health centre within the previous 12 months (99%). Around 40% of cases were priority 1 and 2 patients with 95% of these attending in the last 6 months. A further 20% of cases had no recording of RHD classification (Table 6).

Table 4 Rheumatic Heart Disease audits and system assessments completed between 2008-2014 (number of client records audited, number of health centres and number of SATs)

		2008	2009	2010	2011	2012	2013	2014	Total
QLD	#Records	30	0	124	290	360	220	19	1,043
	#Centres	1	0	6	18	28	20	1	34
	#SATs	1	0	2	13	17	14	0	47
NT	#Records	154	155	140	229	177	399	240	1,494
	#Centres	6	7	5	8	6	14	8	24
	#SATs	5	6	5	6	2	4	2	30
SA	#Records	0	0	0	5	0	7	0	12
	#Centres	0	0	0	1	0	1	0	1
	#SATs	0	0	0	1	0	0	1	2
WA	#Records	0	0	0	0	0	0	32	32
	#Centres	0	0	0	0	0	0	1	1
	#SATs	0	0	0	0	0	0	1	1
Total	#Records	184	155	264	524	537	626	291	2,581
	#Centres	7	7	11	27	34	35	10	60
	#SATs	6	6	7	20	19	18	4	80

Table 5 Rheumatic Heart Disease audits completed between 2008 and 2014 by audit cycle (number of client records audited and number of health centres)

		1	2	3	4	5	6	Total
QLD	#Records	440	292	199	93	19	0	1,043
	#Centres	34	22	13	4	1	0	34
NT	#Records	594	420	189	121	104	66	1,494
	#Centres	24	13	6	5	4	2	24
SA	#Records	5	7	0	0	0	0	12
	#Centres	1	1	0	0	0	0	1
WA	#Records	32	0	0	0	0	0	32
	#Centres	1	0	0	0	0	0	1
Total	#Records	1,071	719	388	214	123	66	2,581
	#Centres	60	36	19	9	5	2	60

Table 6 Characteristics of participating health centres and patients whose records were audited between 2009 & 2014 (number & %)

		2008		2009		2010		2011		2012		2013		2014		Overall	
Primary Health Care Centres		**7**		**7**		**11**		**27**		**34**		**35**		**10**		**60**	
Location	Urban	0	0%	0	0%	0	0%	1	3.7%	1	3%	2	5.7%	1	10%	3	5%
	Regional	1	14%	1	14%	2	18%	1	3.7%	4	12%	2	5.7%	1	10%	4	7%
	Remote	6	86%	6	86%	9	82%	25	92.6%	29	85%	31	88.6%	8	80%	53	88%
Governance	Community-controlled	3	42.9%	4	57.1%	3	27%	3	11%	1	3%	3	9%	5	50%	8	13%
	Government	4	57.1%	3	42.9%	8	73%	24	89%	33	97%	32	91%	5	50%	52	87%
Population Size	≤500	1	14.3%	1	14%	1	9%	10	37%	16	47%	13	37%	1	10%	19	32%
	501-999	1	14.3%	2	29%	1	9%	4	15%	5	15%	5	14%	2	20%	14	23%
	≥1000	5	71.4%	4	57%	9	82%	13	48%	13	38%	17	49%	7	70%	27	45%
Completed RHD audits	1 or 2 cycles	7	100%	7	100%	6	55%	24	89%	27	79%	20	57.1%	5	50%	41	68%
	≥3 CQI cycles	0	0%	0	0%	5	45%	3	11%	7	21%	15	42.9%	5	50%	19	32%
Number of audited records		**184**		**155**		**264**		**524**		**537**		**626**		**291**		**2,581**	
	Age (mean & range)	29 (5-71)		30 (6-79)		28 (7-80)		30 (4-82)		27 (3-82)		28 (2-78)		32 (5-75)		28 (2-82)	
Sex	Male	70	38%	59	38%	102	39%	178	34%	226	42%	225	36%	110	38%	970	38%
	Female	114	62%	96	62%	162	61%	346	66%	311	58%	401	64%	181	62%	1,611	62%
Indigenous status	Yes	182	99%	151	97%	228	86%	488	93%	503	94%	589	94%	286	98%	2,427	94%
	No	1	0.5%	0	0%	2	1%	7	1%	7	1%	6	1%	2	1%	25	1%
	Not recorded	1	0.5%	4	3%	34	13%	29	6%	27	5%	31	5%	3	1%	129	5%
Reason for last attendance	BPG Injection	77	42%	55	35%	94	35.6%	230	44%	254	47%	324	52%	101	35%	1,135	44%
	Oral antibiotic prophylaxis	4	2%	0	0%	2	0.8%	1	0%	5	1%	7	1%	5	2%	24	1%
	Acute care	60	32.6%	54	35%	84	31.8%	126	24%	135	25%	128	20%	69	24%	656	25%
	Well person's check	9	4.9%	5	3%	5	1.9%	20	4%	16	3%	14	2%	18	6%	87	3%
	Specialist Review	9	4.9%	9	6%	11	4.2%	24	5%	14	3%	24	4%	4	1%	95	4%
	Other	25	13.6%	32	21%	68	25.8%	123	23%	113	21%	129	21%	94	32%	584	23%
Profession patient first seen by	ATSIHP	67	36.4%	44	28%	58	22%	79	15.1%	126	23%	84	13%	64	22%	522	20%
	Nurse	84	45.7%	79	51%	154	58.3%	366	69.8%	338	63%	430	69%	162	56%	1,613	62%
	GP	27	14.7%	20	13%	34	12.9%	45	8.6%	51	9%	81	13%	47	16%	305	12%
	Specialist	3	1.6%	4	3%	7	2.7%	14	2.7%	9	2%	15	2.4%	5	2%	57	2%
	Allied health	1	0.5%	0	0%	2	0.8%	3	0.6%	5	1%	3	0.5%	4	1%	18	1%
	Other	1	0.5%	2	1%	1	0.4%	11	2.1%	3	1%	13	2.1%	9	3%	40	2%
	Not stated	1	0.5%	6	4%	8	3%	6	1.1%	5	1%	0	0%	0	0%	26	1%
RHD Classification	Priority 1: Severe	29	16%	21	14%	44	17%	97	19%	91	16.9%	134	21%	73	25%	489	18.9%
	Priority 2: Moderate	29	16%	24	15%	40	15%	111	21%	121	22.5%	133	21%	43	15%	501	19.4%
	Priority 3: Mild, ARF	56	30%	58	37%	90	34%	194	37%	250	46.6%	310	50%	111	38%	1,069	41.4%
	Unable to determine	0	0%	0	0%	0	0%	0	0%	0	0%	4	1%	17	6%	21	0.8%
	Not recorded	70	38%	52	34%	90	34%	122	23%	75	14%	45	7%	47	16%	501	19.4%
Time since last attendance	Within 6 months (priority 1&2)	51	88%	44	98%	77	92%	196	94%	196	92%	265	99%	110	95%	939	95%
	Within 12 months (priority 3)	55	98%	57	98%	88	98%	193	99%	244	98%	307	99%	111	100%	1,055	99%

2.1 Presentation of data

Audit data on indicators relevant to the identified evidence-practice gaps in ARF/RHD care are presented over time in two ways - by year and by audit cycle.

By year - includes data for all participating health centres and provides an indication of influences on clinical performance that may be occurring at different times in the general health system environment. These influences might include changes in CQI processes, changes in the number and types of participating health centres and various other influences on the CQI data that are generated through the use of One21seventy tools.

By audit cycle - includes data for the same cohort of health centres that have conducted ARF/RHD health audits in at least three audit cycles. This presentation provides an indication of the impact of duration of participation in CQI on delivery of care according to best practice guidelines. Note that 'Audit Cycle 1' represents baseline audit data, 'Audit Cycle 2' represents the first follow-up audit and so on.

Box plots are used to show variation between health centres

An important focus of the ABCD Partnership is understanding variation between health centres and over time in delivery of care in accordance with best practice guidelines. 'Box and whisker plots' (or box plots) are a useful way of presenting data on variation in a graphical form that should assist with interpretation.

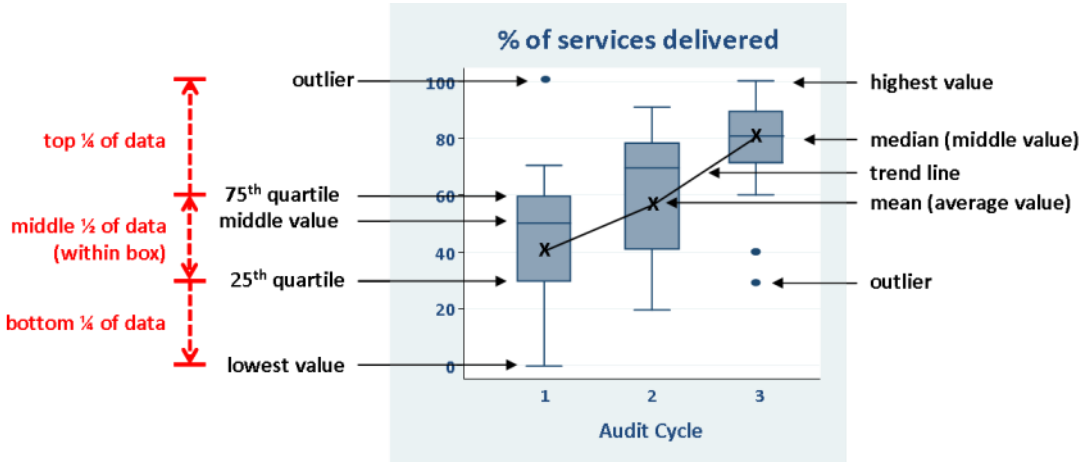
In the analysis of the audit data, the mean (average) percent delivery of items of clinical care relevant to each indicator is calculated for each health centre. These mean percentages are displayed in a box plot for a given year or audit cycle to show the distribution or range in recorded delivery of care between health centres.

How to interpret box and whisker plots

Box and whisker plots show (Box 2):

- health centres with the minimum and maximum mean percentage in recorded delivery of care in accordance with best practice guidelines (ends of whiskers show highest value if no outliers);
- outliers – health centres that are far away from most others in the data set (or a distance that is greater than 1.5 times the length of the box); and
- the level of variation between health centres in recorded delivery of care by dividing scores into quarters:
    - the box represents the middle 50% of health centres, and the line within the box represents the median (or middle health centre);
    - the 'whisker' at the top of the box (and outliers if present) represents the top 25% of health centres
    - the 'whisker' at the bottom of the box (and outliers if present) represents the bottom 25% of health centres;
    - the longer the box plot, the greater the range of care delivery (or variation) between health centres.

Box 2. Interpretation of boxplots



In assessing data trends for indicators relevant to the priority evidence practice gaps, it is helpful to focus on:

a. **the trend for the mean (average) and median (middle) values for health centres** – in particular whether the mean and median are increasing, staying steady or decreasing; and

b. **the trend in the variation between health centres** – in particular whether the variation is getting less (shorter boxes, shorter whiskers), and importantly, whether there is an improvement in the values for the health centres at the lower end of the range (higher level for the bottom end of whiskers).

2.2 Overall ARF/RHD service delivery

Figure 14 shows trends in a composite indicator of overall service delivery to patients with ARF/RHD in accordance with best practice guidelines. The composite indicator* includes services such as recording of RHD classification and management plans, BPG injections, follow-up if poor adherence to BPG schedule, timely checks and client education.

Summary of trends (Figure 14)

Over years

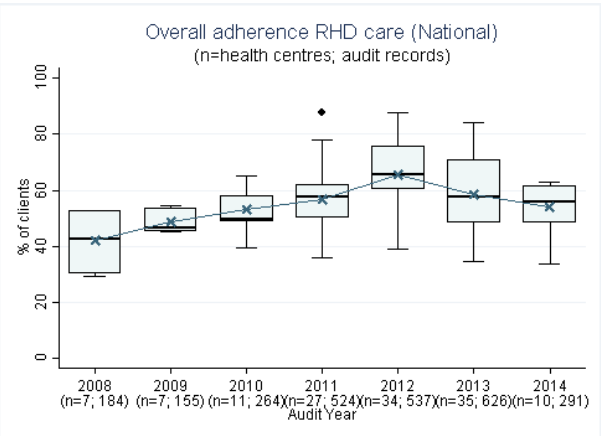
- There has been an improvement in the overall service delivery for RHD prevention and care – most notably between 2008 and 2012, with a decline in 2013 – 14. The mean and median level of care delivery improved from about 40% in 2008 to about 65% in 2012, dropping to about 55% 2014.
- There was no reduction in variation in service delivery between health centres.

Over successive audit cycles

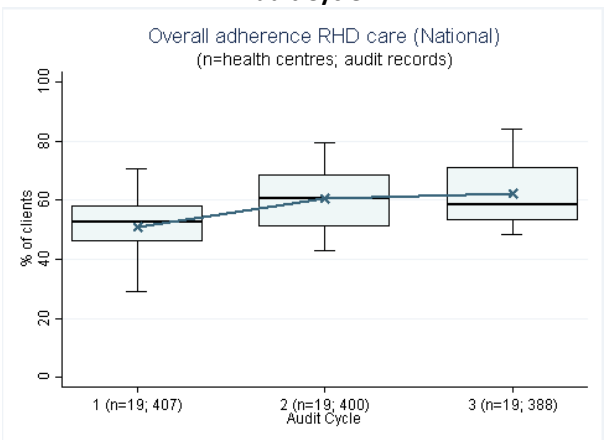
- For health centres that completed three audit cycles for RHD prevention and care, there were improvements, albeit small, in the mean level of care according to best practice guidelines.
- There was little evidence of narrowing in the variation between health centres over successive audit cycles.

Figure 14 Mean health centre overall service delivery to ARF/ RHD clients, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of client records audited)

Year



Audit Cycle



*Composite indicator includes up to nine best practice indicators present in the RHD audit tool: RHD classification recorded in health summary; record of current and complete ARF/RHD management plan; record of planned frequency of BPG injections (if client prescribed regular BPG injections);≥80% of BPG injections received (if client prescribed regular injections and there is record of planned frequency); record of active recall if <80% of injections received; timely doctor and specialist review and echocardiogram (according to recommended schedule based on RHD classification); and record of client education (provided within the last 12 months).

2.3 Overall health centre systems

Figure 15 shows the average component scores within the relevant system domain for health centres that undertook a systems assessment (SAT) between 2005 and 2015. For background information on the SAT, please refer to Appendix A. Nationally, 33 of the 60 health centres that completed an ARF/RHD health audit undertook a systems assessment at least once over this period. Table 4 provides more information on the frequency of SAT completion over years. In brief, each item is scored separately on a scale of 0 - 11. System domain scores are derived from the average of the scores for each component within the system domain. Higher scores reflect better function.

Summary of trends (Figure 15)

Over years

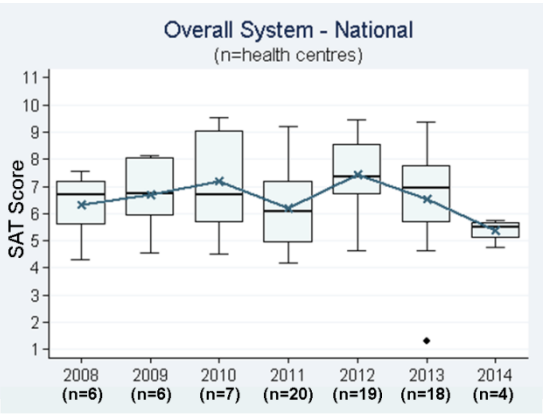
- There is no clear increasing or decreasing trend in the mean or median for the overall health centre SAT scores.
- There was wide variation amongst health centres, with no clear increasing or decreasing trend in variation over time.

Over successive audit cycles

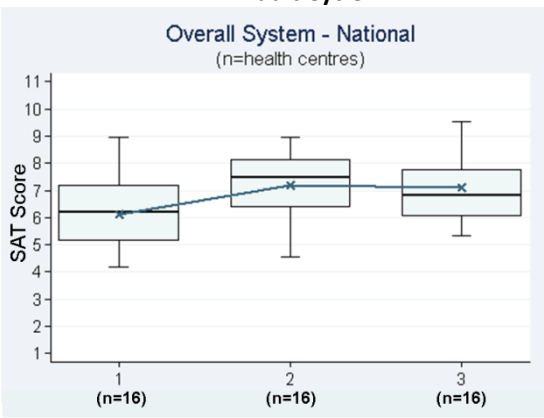
- For health centres that completed three systems assessments, there was a small improvement in the mean overall SAT score.
- There was no clear trend in variation for all health centres that had completed three audit cycles.

Figure 15 Overall system assessment score*, by year for all health centres and by cycle for health centres that have at least 3 years of systems assessment data (n=number of health centres that conducted a systems assessment)

Year



Audit Cycle



*Overall score is the average of each of the five domain scores that make up the total systems assessment (ie, delivery system design, information systems and decision support, self-management support, links with the community, other health services and other resources and organisational influence and integration.

2.4 Increase uptake of planned BPG injections to 80% or more for all clients who are prescribed injections

Figure 16 shows the mean health centre percentage of clients with BPG injections > 80% of planned frequency.

Summary of trends (Figure 16)

Over years

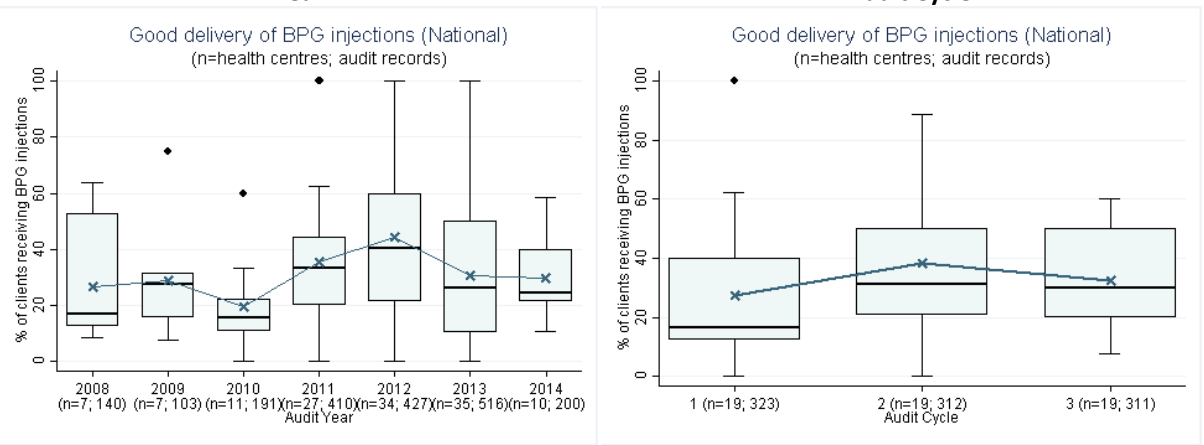
- There is no clear improvement in the percentage of clients recorded as receiving >80% of prescribed injections.
- There was no reduction in variation between health centres in the percentage of clients recorded as receiving >80% of prescribed injections.

Over successive audit cycles

- For health centres that completed three audit cycles for RHD prevention and care, there was improvement from less than 20% to about 30%, in the median percentage of clients recorded as receiving >80% of prescribed injections.
- There was limited evidence of narrowing in the variation between health centres over successive audit cycles.

Figure 16 **Mean health centre percentage of clients with BPG injections > 80% of planned frequency, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).**

Year **Audit Cycle**



2.5 Record of follow-up action if BPG injections <80% of planned frequency

Figure 17 shows the mean health centre recording of various follow-up actions if there is evidence of poor BPG injection delivery, by audit year for all health centres.

Summary of trends (Figure 17)

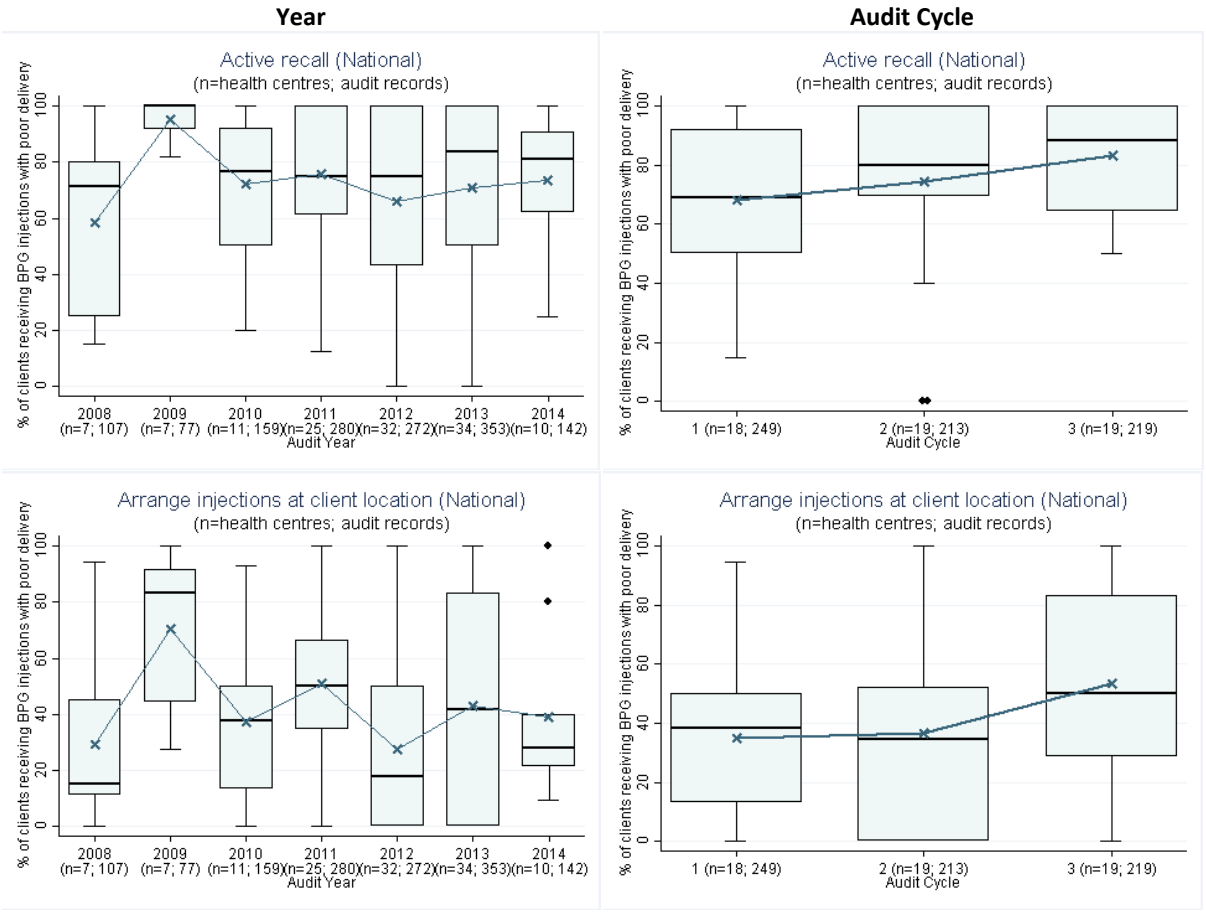
Over years

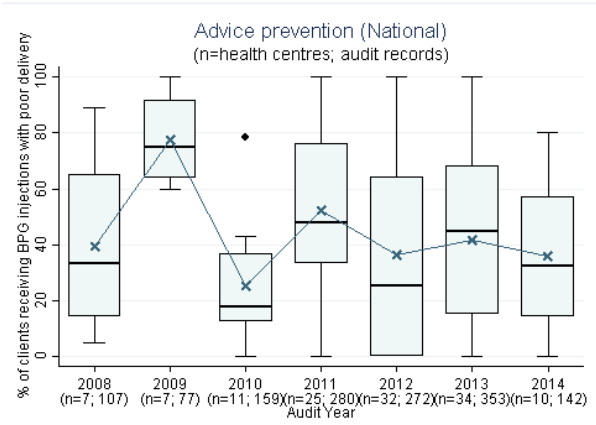
- There is no clear improvement in record of follow-up actions for clients who were not receiving regular injections.
- There was no reduction in variation in between health centres.

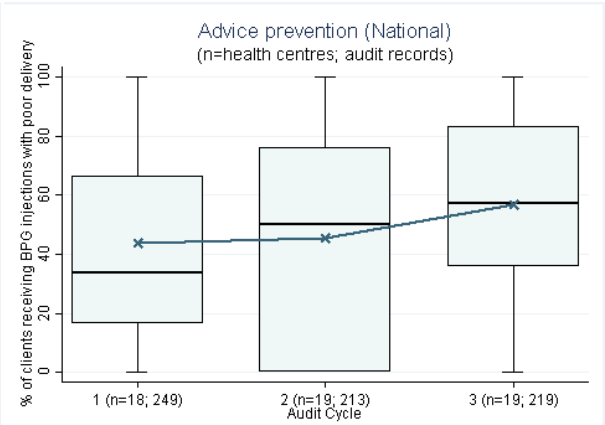
Over successive audit cycles

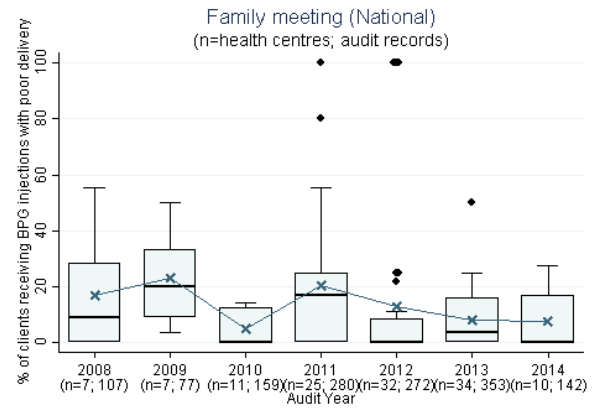
- For health centres that completed three audit cycles for RHD prevention and care, there was steady improvement in recording of a number of follow-up actions for clients who were not receiving regular injections.
- There was narrowing in the variation between health centres over successive audit cycles in recording of some follow-up actions for clients who were not receiving regular injections, with improvement at the bottom end of the range.

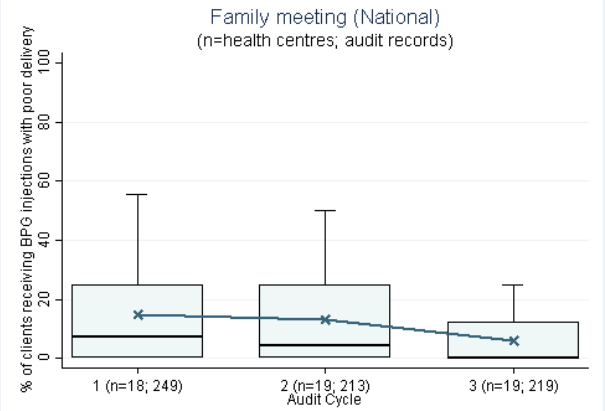
Figure 17 **Mean health centre percentage of clients with record of follow-up action if BPG injections <80% of planned frequency, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients with poor BPG delivery).**

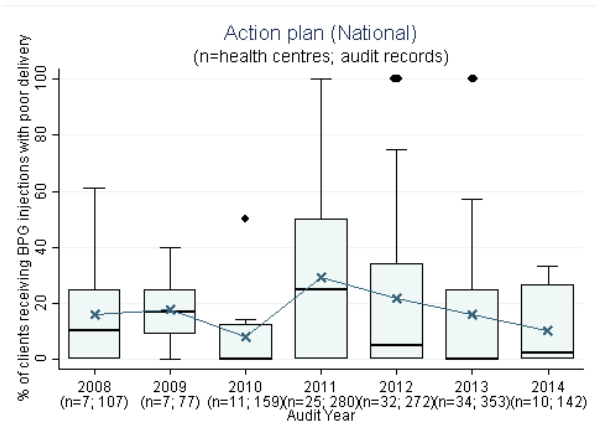


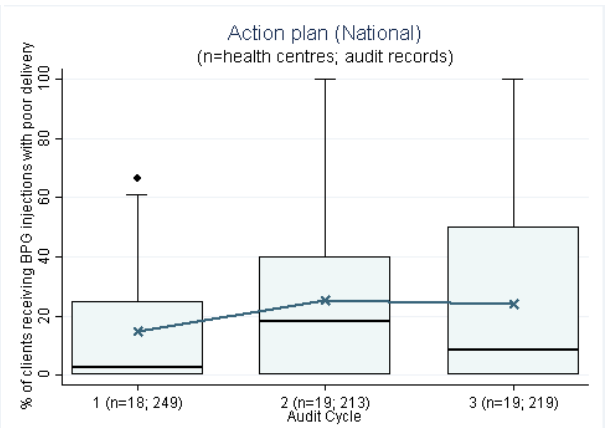

Advice prevention (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
2008 (n=7; 107)
2009 (n=7; 77)
2010 (n=11; 159)
2011 (n=25; 280)
2012 (n=32; 272)
2013 (n=34; 353)
2014 (n=10; 142)
Audit Year

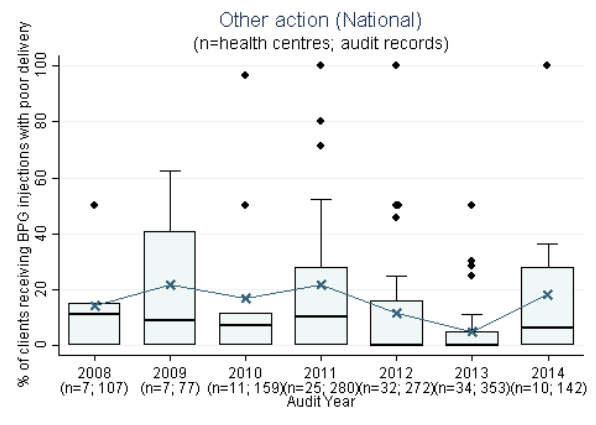

Advice prevention (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
1 (n=18; 249)
2 (n=19; 213)
3 (n=19; 219)
Audit Cycle

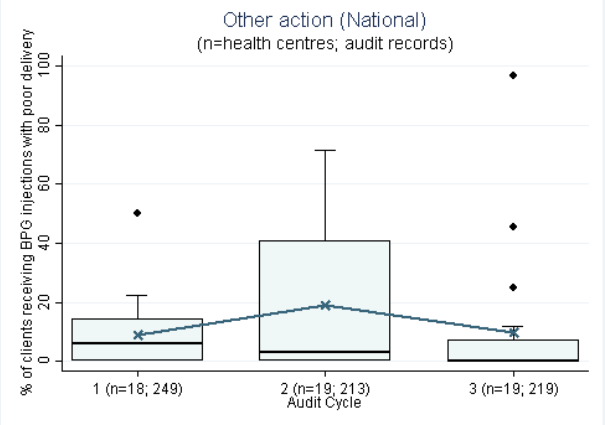

Family meeting (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
2008 (n=7; 107)
2009 (n=7; 77)
2010 (n=11; 159)
2011 (n=25; 280)
2012 (n=32; 272)
2013 (n=34; 353)
2014 (n=10; 142)
Audit Year


Family meeting (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
1 (n=18; 249)
2 (n=19; 213)
3 (n=19; 219)
Audit Cycle


Action plan (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
2008 (n=7; 107)
2009 (n=7; 77)
2010 (n=11; 159)
2011 (n=25; 280)
2012 (n=32; 272)
2013 (n=34; 353)
2014 (n=10; 142)
Audit Year


Action plan (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
1 (n=18; 249)
2 (n=19; 213)
3 (n=19; 219)
Audit Cycle


Other action (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
2008 (n=7; 107)
2009 (n=7; 77)
2010 (n=11; 159)
2011 (n=25; 280)
2012 (n=32; 272)
2013 (n=34; 353)
2014 (n=10; 142)
Audit Year


Other action (National)
(n=health centres; audit records)
% of clients receiving BPG injections with poor delivery
0
20
40
60
80
100
1 (n=18; 249)
2 (n=19; 213)
3 (n=19; 219)
Audit Cycle

2.6 Improve disease management planning

Figure 18 shows the mean health centre record of a current and completed ARF/RHD management plan in the client's health summary.

Summary of trends (Figure 18)

Over years

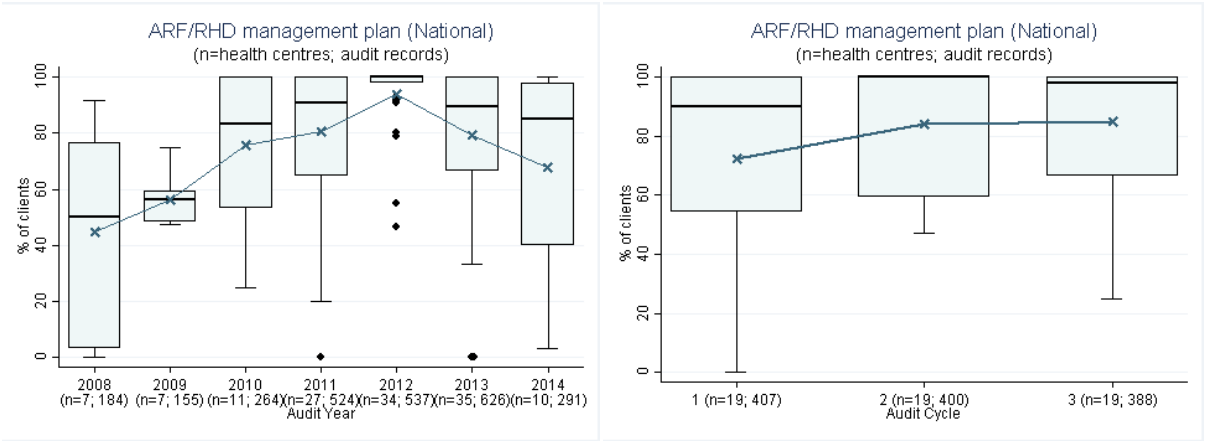
- There are clear improvements in the recording of ARF/RHD Management Plans overtime most notably between 2008 and 2012 with a decline to 2014. The median level increased from about 50% (mean 45%) in 2008 to over 80% (mean 65%) in 2014.
- There was no reduction in variation between health centres.

Over successive audit cycles

- For health centres that completed three audit cycles for RHD prevention and care there were improvements in recording of ARF/RHD Management Plans.
- There was evidence of narrowing in the variation between health centres over successive audit cycles, with improvement among health centres at the lower end of the range.

Figure 18 **Mean health centre recording of a current and completed ARF/RHD management plan in client's health summary, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).**

Year **Audit Cycle**



2.7 Improve recording of key information related to delivery of BPG injections

Figure 19 shows the mean health centre record of planned frequency of BPG injections on current prescription and on clinic master sheet.

Summary of trends (Figure 19)

Over years

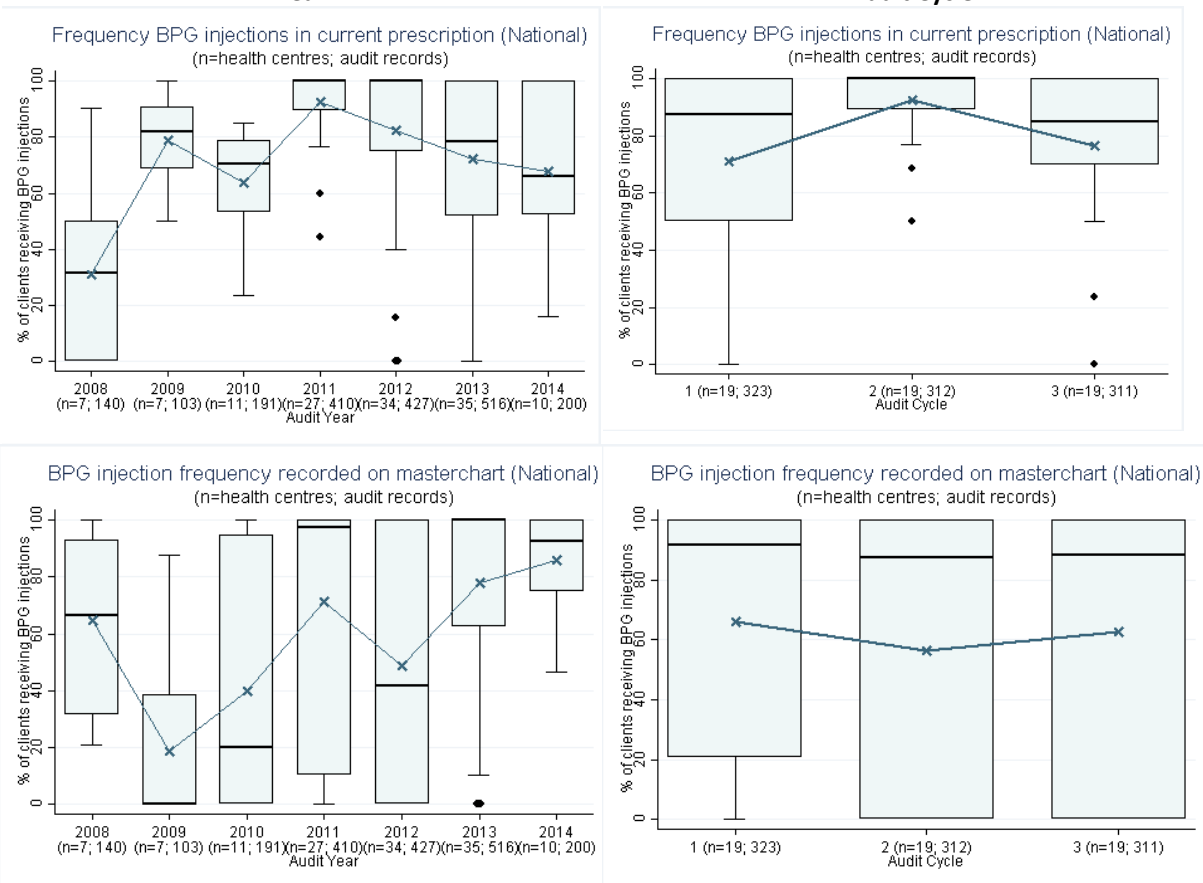
- There is relatively wide fluctuation between years in the median and mean levels of recording of planned frequency of injections on current prescriptions and on clinic master charts, and it is difficult to discern clear trends over time in these indicators.
- There was wide variation between health centres in many years, with no clear trend in variation.

Over successive audit cycles

- For health centres that completed three audit cycles for RHD prevention and care there was no evidence of improvement in recording of planned frequency of injections on current prescriptions and on clinic master charts.
- There was no evidence of narrowing in the variation between health centres over successive audit cycles.

Figure 19 Mean health centre recording of planned frequency of BPG injections on current prescription and on clinic master chart, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).

Year **Audit Cycle**



2.8 Improve levels of recording ARF diagnoses

Figure 20 shows the mean health centre recording of a definitive ARF diagnoses in the health summary record.

Summary of trends (Figure 20)

Over years

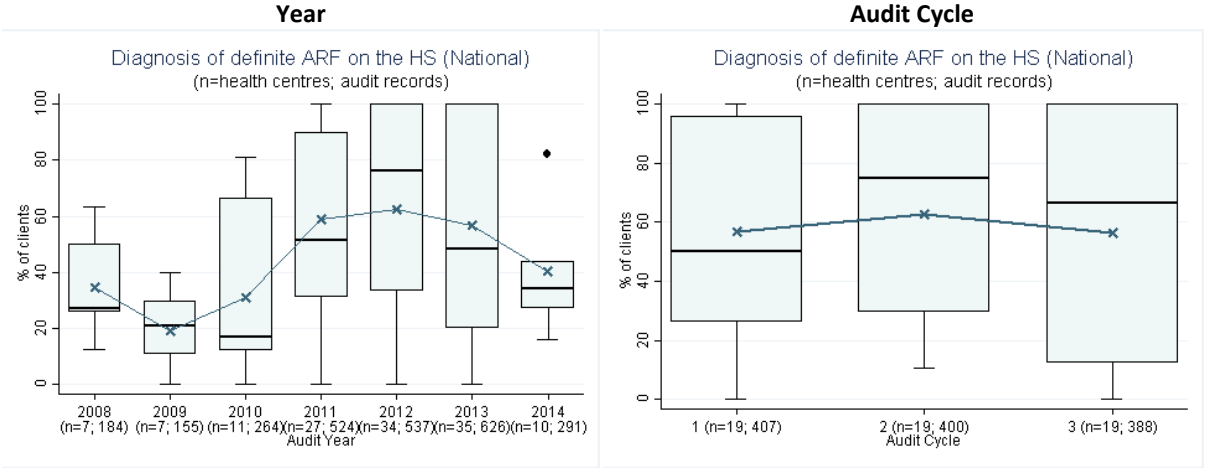
- While there appears to have been an improvement between 2008 and 2012, the median and mean levels of recording a diagnosis of ARF in the health summary record in 2014 are similar to those in 2008.
- There was no reduction in variation between health centres over time.

Over successive audit cycles

- For health centres that completed three audit cycles for RHD prevention and care there was improvement in the median level of recording a diagnosis of ARF in the health summary record, but no change in the mean.
- There was no narrowing in the variation between health centres over successive audit cycles.

Figure 20 **Mean health centre recording of ARF (or suspected ARF) diagnoses on health summaries, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).**

Year **Audit Cycle**



2.9 Strengthen efforts to provide interventions for clients who have ARF despite adequate injection delivery

Figure 21 shows the mean health centre recording of various follow-up actions if recurrent ARF despite a record of delivery of ≥80% of scheduled BPG injections.

Summary of trends (Figure 21)

Over years

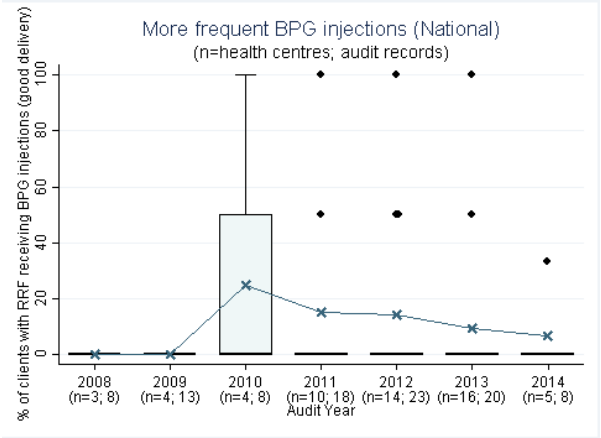
- There was no clear evidence of increase in frequency of prescribed BPG, or in provision of advice regarding skin and throat infections or overcrowding, development of an action plan, referral to support services or other action for clients with a record of ARF despite having ≥80% of scheduled BPG injections3.
- There was no reduction in variation between health centres for these indicators.

Over successive audit cycles

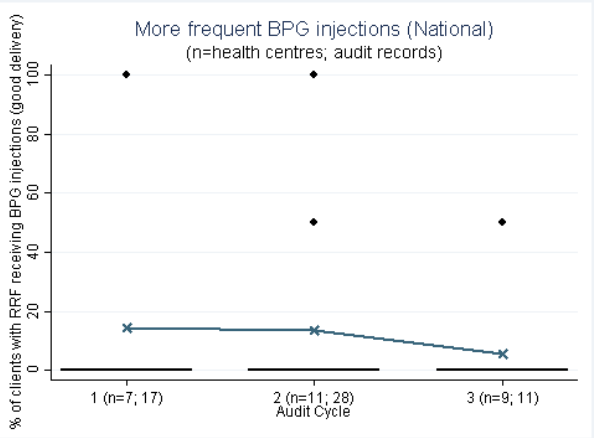
- For health centres that completed three audit cycles for RHD prevention and care, there was no evidence of improvement in these indicators.
- There was no reduction in variation between health centres for these indicators over successive audit cycles.

Figure 21 Mean health centre recording of follow-up action if recurrent ARF despite ≥80% of BPG injections delivered, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).

Year



Audit Cycle



[3] Note the relatively small number of clients for whom these indicators are relevant

Figure 21 cont: Mean health centre recording of follow-up action if recurrent ARF despite ≥80% of BPG injections delivered, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).

Year | **Audit Cycle**

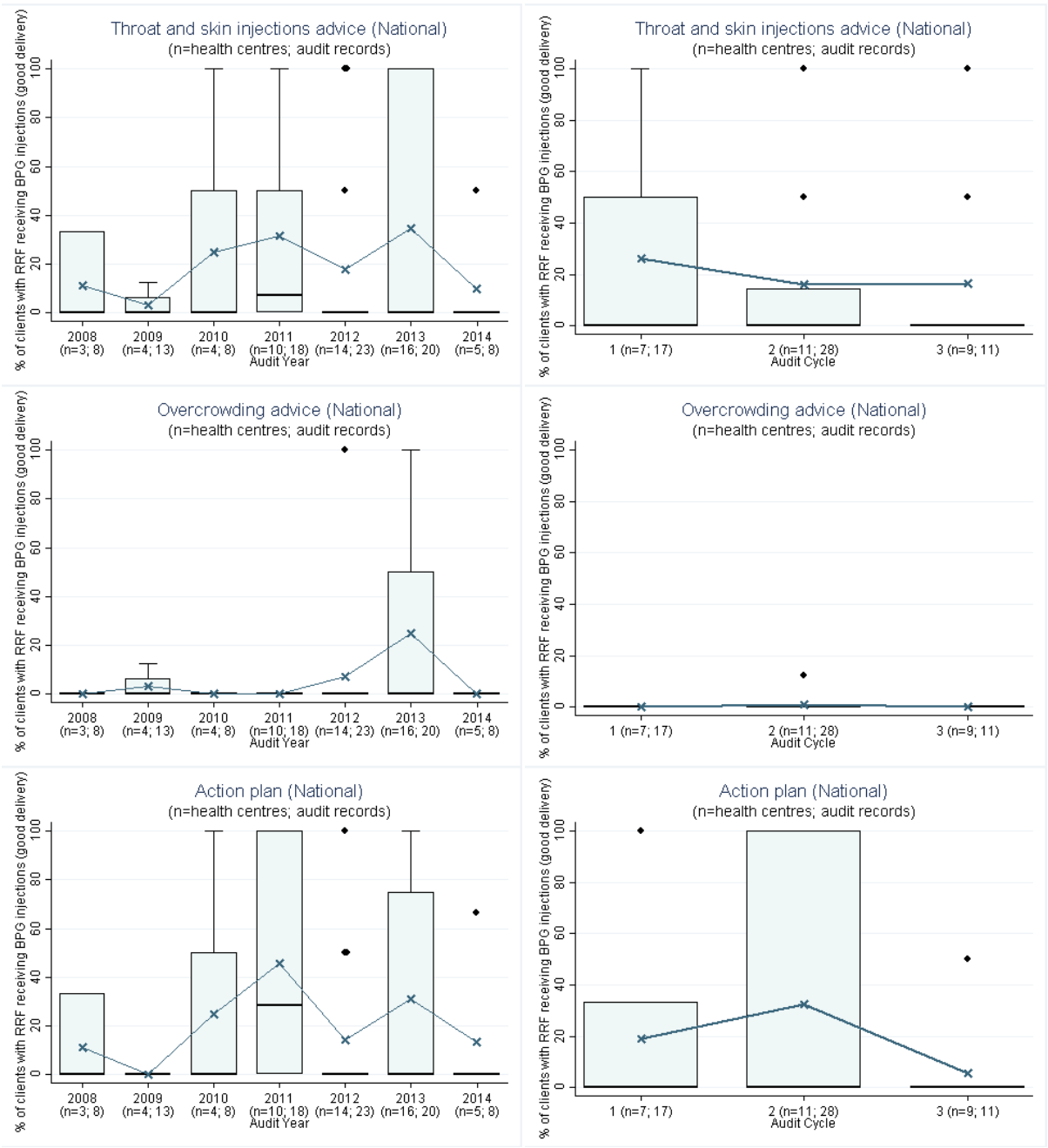
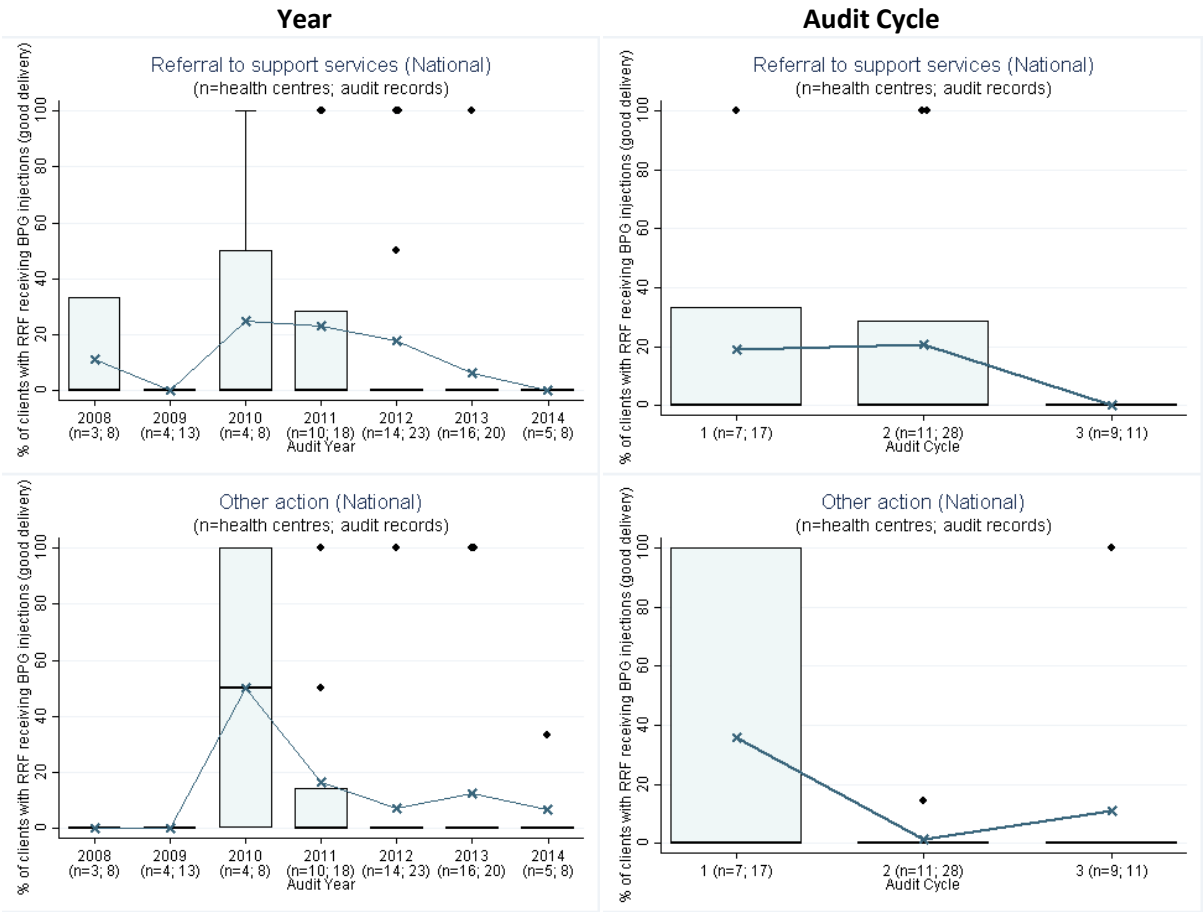


Figure 21 cont: Mean health centre recording of follow-up action if recurrent ARF despite ≥80% of BPG injections delivered, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of clients).



2.10 Improve the practice and recording of rheumatic fever education

Figure 22 shows the mean health centre documentation of rheumatic fever education being provided.

Summary of trends (Figure 22)

Over years

- There is no clear evidence of improvement in the percentage of clients recorded as receiving RHD education.
- There was no clear evidence of reduction in variation between health centres in the percentage of clients recorded as receiving RHD education.

Over successive audit cycles

- For health centres that completed three audit cycles for RHD prevention and care, there was improvement from about 10% to about 30%, in the median percentage of clients recorded as receiving RHD education.
- There was no evidence of narrowing in the variation between health centres over successive audit cycles.

Figure 22 **Mean health centre documentation of rheumatic fever education being provided, by audit year for all health centres and by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of client).**

Year **Audit Cycle**