# Data Supplement

# Final Report: Primary Health Care for Aboriginal and Torres Strait Islander Children

ESP Project: Priority Evidence-Practice
Gaps and Stakeholder Views on Barriers
and Strategies for Improvement

December 2014

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# 1. Phase 1 data report:  Identifying priority evidence-practice gaps

The data presented in this section is from the Phase 1 child health report '*Report on national child health clinical audit and systems assessment data 2012 – 2013'*. This report is available on request. This report and data were products of the first phase of the ESP Project whereby we sought feedback on identifying priority areas for improvement in Aboriginal and Torres Strait Islander child health care. The data presented reflect indicators of quality across the scope of clinical practice and health centre systems for child health care (based on national and jurisdictional care protocols). The data are sourced from participating health centres that last used the One21seventy child health audit tool and systems assessment tool in either 2012 or 2013.

## 1.1.    Profile of health centres

The child health audit tool was used in 94 different health centres in 2012 or 2013 (Table 1.1). These health centres had used the child health audit tools for varying numbers of cycles prior to 2012/2013, and the prior experience of use of the child health audit tool varied between jurisdictions (Table 1.2). The child health audit tool had been used by a relatively large number of health centres in Qld and the NT, and in relatively more audit cycles in Far West New South Wales (FWNSW), NT and Qld. The data included in the analysis for this report were extracted in July 2013.

A total of 4,011 records were audited in the 94 health centres in 2012 or the first half of 2013. For 45 of these health centres the child health audit tool had been used most recently in 2012 (1,889 records audited), and for 49 health centres the audit tool was used in 2013 (2,122 records audited). A smaller number of health centres (62) recorded a completed systems assessment in the One21seventy database, with the majority of these being in Qld and the NT.

***Table 1.1. Most recent child health audit and systems assessment completed in 2012 or 2013 (number of child health records audited, number of health centres and number of SATs)***

|  |  | 2012 | 2013 | Total |
|---|---|---|---|---|
| FWNSW | #Audits |  | 179 | 179 |
|  | #Centres |  | 4 | 4 |
|  | #SATs |  | 0 | 0 |
| NT | #Audits | 802 | 316 | 1,118 |
|  | #Centres | 24 | 13 | 37 |
|  | #SATs | 13 | 10 | 23 |
| QLD | #Audits | 798 | 1,500 | 2,298 |
|  | #Centres | 16 | 30 | 46 |
|  | #SATs | 11 | 26 | 37 |
| SA | #Audits | 229 | 67 | 296 |
|  | #Centres | 4 | 1 | 5 |
|  | #SATs | 0 | 0 | 0 |
| WA | #Audits | 60 | 60 | 120 |
|  | #Centres | 1 | 1 | 2 |
|  | #SATs | 1 | 1 | 2 |
| Total | #Audits | 1,889 | 2,122 | 4,011 |
|  | #Centres | 45 | 49 | 94 |
|  | #SATs | 25 | 37 | 62 |

Most recent child health audit completed in 2012 and 2013 by audit cycle (number of child health records audited and number of health centres)

| | | Cycle | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| FWNSW | #Audits | | | | | | | 179 | 179 |
| | #Centres | | | | | | | 4 | 4 |
| NT | #Audits | 410 | 258 | 270 | 37 | 113 | 30 | | 1,118 |
| | #Centres | 12 | 11 | 9 | 1 | 3 | 1 | | 37 |
| QLD | #Audits | 281 | 100 | 787 | 771 | 359 | | | 2,298 |
| | #Centres | 6 | 3 | 15 | 15 | 7 | | | 46 |
| SA | #Audits | 202 | 94 | | | | | | 296 |
| | #Centres | 4 | 1 | | | | | | 5 |
| WA | #Audits | | | 60 | | 60 | | | 120 |
| | #Centres | | | 1 | | 1 | | | 2 |
| Total | #Audits | 893 | 452 | 1,117 | 808 | 532 | 30 | 179 | 4,011 |
| | #Centres | 22 | 15 | 25 | 16 | 11 | 1 | 4 | 94 |

Over 80% of the health centres are in remote communities and over 80% are government managed (Table 1.3). Overall 92% of audited records were for children who were identified as Aboriginal or Torres Strait Islander. Overall 95% of audited records showed a record of attendance at the child health centre within the previous 12 months. Over 50% of these attendances were for acute care, and about 20% were for a 'child health check'. National data shows that initial assessment at the health centre was most commonly by a nurse, with Aboriginal Health Worker (AHW)/ Aboriginal and Torres Straight Island Health Practitioner (ATSIHP) being the next most common profession to do the initial assessment.

***Table 1.2. Characteristics of health centres and children whose records were audited during 2012-2013 (N & %)***

| | | Total |
|---|---|---|
| **Primary Health Care Centres** | | **94** |
| **Location** | Urban | 4 | 4% |
| | Regional | 10 | 11% |
| | Remote | 80 | 85% |
| **Governance** | Government | 77 | 82% |
| | Community Controlled | 17 | 18% |
| **Size of population served** | ≤500 | 46 | 49% |
| | 501-999 | 22 | 23% |
| | ≥1000 | 26 | 28% |
| **Completed child health audit cycles** | Baseline | 22 | 23% |
| | 1-2 cycles | 40 | 43% |
| | ≥3 cycles | 32 | 34% |
| **Number of audited records** | | **4011** |
| **Age Groups** | <1 year | 530 | 13% |
| | 1-<3 years | 969 | 24% |
| | 3-<6 years | 1045 | 26% |
| | ≥6 years | 1467 | 37% |
| **Gender** | Males | 2046 | 51% |
| | Females | 1965 | 49% |
| **Indigenous status** | Indigenous | 3682 | 92% |
| | Non-indigenous | 252 | 6% |
| | Not stated | 77 | 2% |
| **Attended within past 12 months** | | 3792 | 95% |
| **Reason for last attendance** | Acute care | 2067 | 52% |
| | Child Health Check | 879 | 22% |
| | Immunisation | 540 | 13% |
| | Other | 525 | 13% |
| **Profession child first seen by** | AHW | 687 | 17% |
| | Nurse | 2455 | 61% |
| | GP | 582 | 15% |
| | Specialist | 109 | 3% |
| | Allied Health | 73 | 2% |
| | Other | 31 | 1% |
| | Not stated | 74 | 2% |

## 1.2. Guide on how to read the boxplots presented in this report

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:

- 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 boxplot, the greater the range (or variation).



| Interpretation: | Examples: |
|---|---|

Interpretation figure showing a box and whisker plot with labels: "middle ½ of data (within box)", "bottom ¼ of data", "top ¼ of data", "outlier", "middle value", with x-axis "% service delivery" from 0 to 100.

Examples:
- Wide variation in service delivery (range 0-100%).
- Health centres relatively equally dispersed across the range. $25^{th}$ to $75^{th}$ 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.

For each service item within the appendix tables, the following summary statistics are recorded:

*Mean*: For each health centre, every instance of an indicator (service item) being recorded on a child's clinic record as delivered is summed up and divided by all records to derive an average percent delivery for that audit cycle. An average percent across all health centres is then calculated by summing individual mean percentages and dividing by the number of health centres. In the example below, the mean value of immunisation charts being recorded as present was 97% across all 37 health centres.

*Range*: Refers to the levels of delivery (%) for the health centre with the lowest level and the health centre with the highest level for each indicator. In the example below, the

lowest health centre had 82% of immunisation charts present for child records audited and the highest health centre had 100% of charts present for all children records audited.

*Standard Error***:** The standard error is a measure of how accurate the mean (%) estimate is to the true mean value. The lower the standard error, the better the estimate.

| | Example | |
|---|---|---|
| **Health Centres** | **37** | |
| **Records Audited** | **1118** | |
| Immunisation | 97 | *Mean %* |
| Chart Present | ±0.74 | *Standard Error* |
| | (82-100) | *Range* |

## 1.3.     Recorded delivery of child health services

The presentation of audit findings on the delivery of child health services follows the structure of the child health audit tool, with sections on immunisation; physical checks; discussion of key influences on health and brief interventions; enquiry about risk factors; and follow-up of abnormal findings.

## 1.4.     Immunisations

Figure 1.1 shows boxplots and summary statistics of health centre percentages of child clients within specific age groups that have completed immunisations as per the relevant jurisdictional schedule.

***Figure 1.1 Record of immunisation completeness according to recommended schedule for health centres during 2012-2013 (mean %, ±SE and range between health centres).***



| | Total 94 | Mean Standard Error Range |
|---|---|---|
| **Health Centres Records Audited** | **4011** | |
| Immunisation Chart Present | | 91 ±1.78 (0-100) |
| **Age** Birth<br>*Hep B (NSW,SA,WA);*<br>*Hep B & BCG (NT,Qld)* | | 67 ±2.74 (0-100) |
| 2 months<br>*DTPa/Hib/ HepB/IPV; 7vPCV or 10vPCV;*<br>*Rotavirus (all states)* | | 84 ±2.39 (0-100) |
| 4 months<br>*DTPa/Hib/ HepB/IPV; 7vPCV or 10vPCV;*<br>*Rotavirus (all states)* | | 81 ±2.39 (0-100) |
| 6 months<br>*DTPa/Hib/HepB/ IPV; 7vPCV or 10vPCV (all*<br>*states) + Rotavirus (Qld,SA)* | | 75 ±2.55 (0-100) |
| 12 months<br>*Hib; MMR; MenCCV (all states) + Hep B*<br>*(Qld,SA) + Hep A (NT,WA)* | | 78 ±3.12 (0-100) |
| 18 months<br>*VZV (all states) + Hep A (NT,Qld,SA,WA) +*<br>*7vPCV (NT) + 23vPPV (WA)* | | 81 ±2.36 (0-100) |
| 2 years<br>*23vPPV; Hep A (Qld,SA)* | | 69 ±4.32 (0-100) |
| 4 years<br>*DTPa/IPV; MMR (all states)* | | 81 ±2.73 (0-100) |
| >10 years<br>*VZV; HPV (females) (all states) + Hep B*<br>*(NSW,Qld,SA,WA) +DTPa (NT,Qld,SA,WA)* | | 16 ±3.45 (0-100) |

*Priorities for improvement on immunisations*

- Improve systems for systematic recording of immunisations in child health records. A significant number of records do not include a chart for recording of immunisations, and there is wide variation between health centres in the proportion of children with an immunisation chart in their clinical record (Figure 1.1).

- Improve delivery and recording of immunisations scheduled for delivery at birth. There is wide variation in the recording of these immunisations between jurisdictions and between health centres (Figure 1.1).

- Improve delivery and recording of immunisations scheduled for delivery at 2 years and older. While there is room for improvement in coverage in all age groups and all jurisdictions, there appears to be a progressive fall off in coverage for children aged 2 years or more. This is particularly marked for immunisations scheduled for delivery to children over the age of 10 years (Figure1.1).

## 1.5. Physical checks

The figures in this section show boxplots and summary statistics of health centre percentages of children with a record of having received scheduled physical checks according to jurisdictional guidelines, including clinical measurements, examinations and developmental checks. A service is recorded as received if provided within the last 12 months of the audit date. Different checks apply to different age groups and jurisdictions as indicated in each figure.

**Figure 1.2 *Record of clinical measurements within the past 12 months for health centres during 2012-2013 (mean %, ±SE and range between health centres).***
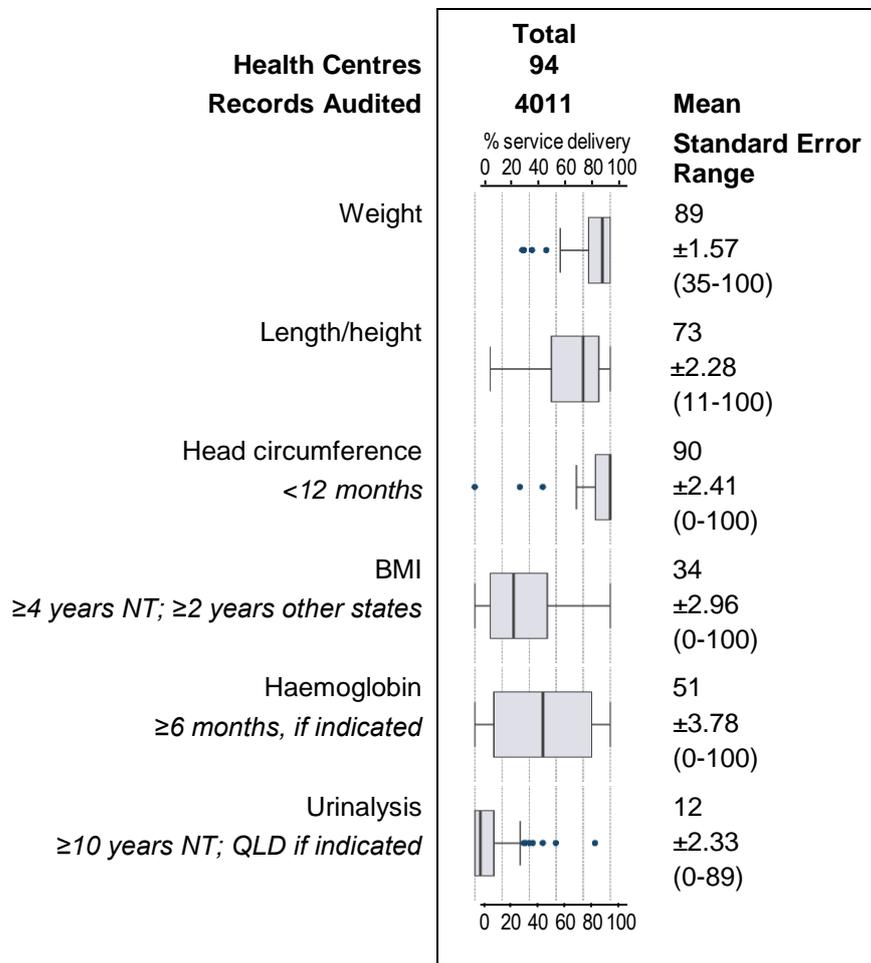
**Figure 1.3 Record of clinical examinations within the past 12 months for health centres during 2012-2013 (mean %, ±SE and range between health centres).**



| Health Centres Records Audited | Total 94 4011 | Mean Standard Error Range |
|---|---|---|
| % service delivery 0 20 40 60 80 100 | | |
| Testes check <12 months | | 72 ±4.03 (0-100) |
| Hip examination <12 months | | 69 ±3.67 (0-100) |
| Gait ≥12 months QLD; ≥18 months NSW | | 45 ±3.59 (0-100) |
| Skin check | | 80 ±2.1 (14-100) |
| Oral hygiene ≥6 months | | 61 ±2.37 (0-100) |
| Cardiac auscultation ≥12 months NT; all ages other states | | 53 ±2.94 (0-100) |
| Respiratory examination | | 69 ±2.54 (0-100) |
| Ear examination | | 78 ±2.27 (0-100) |
| Eye examination ≥4 years NT; all ages other states | | 54 ±2.82 (0-100) |
| Trachoma ≥4 years NT; if indicated other states | | 25 ±3.65 (0-100) |

0 20 40 60 80 100

***Figure 1.4 Record of developmental checks within the past 12 months for health centres during 2012-2013 (mean %, ±SE and range between health centres).***



| | Total | |
|---|---|---|
| **Health Centres** | **94** | |
| **Records Audited** | **4011** | **Mean Standard Error Range** |
| | % service delivery 0 20 40 60 80 100 | |
| Developmental milestones *<4 years* | | 72 ±2.5 (0-100) |
| Vision *≥6 months NT & QLD; all ages NSW, WA* | | 55 ±2.7 (0-100) |
| Hearing *≥6 months NT; all ages other states* | | 64 ±2.34 (7-100) |
| Parent-Child Interaction *<4 years QLD & WA; <2 years NT; other states if indicated* | | 71 ±2.8 (0-100) |
| | 0 20 40 60 80 100 | |
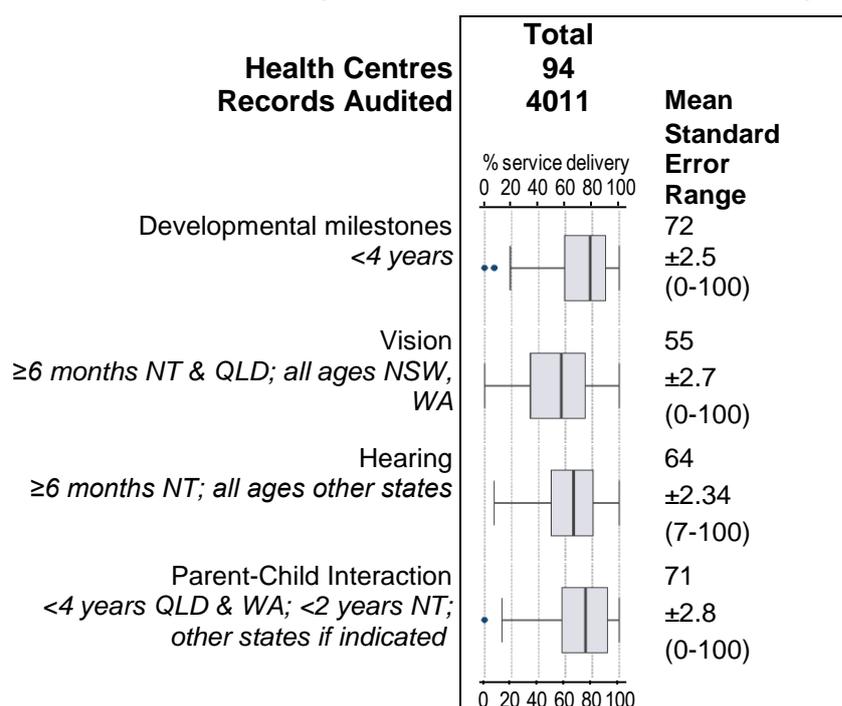
## *Priorities for improvement on clinical examinations*

- Improve systems for systematic recording of essential measures such as weight in child health records. Weight is an important indicator of growth, development and general health in children. A significant number of records do not include a recent record of the child's weight, and there is wide variation between health centres in the proportion of children with a recent measure of weight (Figure 1.2). Low levels and wide variation of recording between health centres appears to be more marked among participating health centres outside of the NT.

- Improve monitoring and recording of haemoglobin according to regional best practice guidelines. Aboriginal and Torres Strait Islander children in many areas suffer from high rates of anaemia, which impacts on their general health and development. The causes of anaemia in many children should be remediable through following recognised clinical guidelines. A significant number of records do not include a recent record of haemoglobin monitoring, and there is wide variation between health centres in the proportion of children with a recent record (Figure 1.2).

- Improve monitoring and recording of developmental milestones – including for vision and hearing. Many children do not have a record of assessment of developmental milestones according to regional best practice guidelines, and there is wide variation between health centres in the proportion of children with a record (Figure 1.4).

## 1.6.     Brief interventions

The following figures show boxplots and summary statistics of health centre percentages of child clients receiving brief interventions on a number of recommended issues. A record of a brief intervention indicates that there has been discussion and/or advice given on the issue within the last 12 months. Different brief interventions apply to different age groups and jurisdictions as indicated in each figure.

***Figure 1.5*** ***Record of discussion on nutrition and preventive factors within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).***



| Health Centres Records Audited | Total 94 4011 | Mean Standard Error Range |
|---|---|---|
| Breastfeeding *<2years* | | 72 ±2.77 (0-100) |
| Nutrition | | 58 ±2.62 (0-100) |
| SIDS prevention *<12 months* | | 56 ±4.45 (0-100) |
| Passive smoking risk *<2years NT; all ages other states* | | 40 ±3.09 (0-100) |
| Infection prevention & hygiene *<3years NT; all ages QLD, SA & WA* | | 36 ±2.64 (0-100) |
| Oral health *≥6months NSW & QLD; ≥8months WA; ≥6months & <5years NT* | | 51 ±2.79 (0-100) |
| Injury prevention *≥18months NSW; ≤4years QLD; ≥6months in SA; <3years NT* | | 37 ±2.9 (0-100) |

**Figure 1.6** **Record of discussion on domestic, social, environmental factors within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).**



| Health Centres<br>Records Audited | Total<br>94<br>4011 | Mean<br>Standard<br>Error<br>Range |
|---|---|---|
| Domestic/social environment<br>*<5years WA; <6years NT; all ages NSW, QLD & SA* | | 43<br>±2.36<br>(0-92) |
| Social or family support<br>*<4years QLD; <5years WA; <6years NT; all ages NSW & SA* | | 54<br>±2.87<br>(0-100) |
| Financial situation<br>*<5years WA & NT* | | 18<br>±3.08<br>(0-80) |
| Housing condition<br>*<5years WA; all ages other states* | | 28<br>±2.44<br>(0-94) |
| Food security<br>*<5years WA; all ages QLD* | | 5<br>±1.31<br>(0-36) |

% service delivery
0 20 40 60 80 100
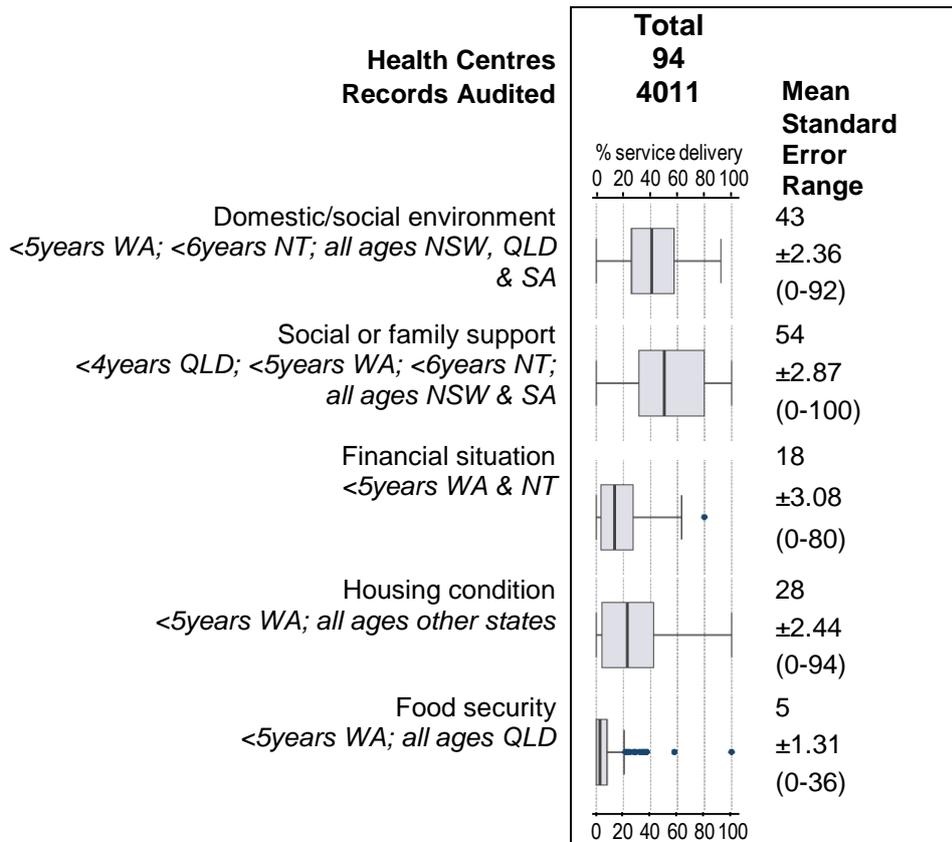
**Figure 1.7** *Record of discussion/delivery of brief intervention for developmental factors within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).*



| Health Centres Records Audited | Total 94 4011 | Mean Standard Error Range |
|---|---|---|
| Physical & mental stimulation ≥6months NSW; <5years QLD,WA & NT | | 48 ±3.16 (0-100) |
| Physical activity ≥3years NSW; >5years QLD; >3years WA; >2years NT | | 34 ±3.2 (0-100) |
| Education progress ≥5 years | | 18 ±2.45 (0-81) |
| Social & emotional wellbeing >5years NSW,SA & NT; all ages QLD & WA | | 35 ±3.32 (0-100) |
| Sexual/reproductive health advice >3years WA; ≥5years NT | | 4 ±1.44 (0-33) |
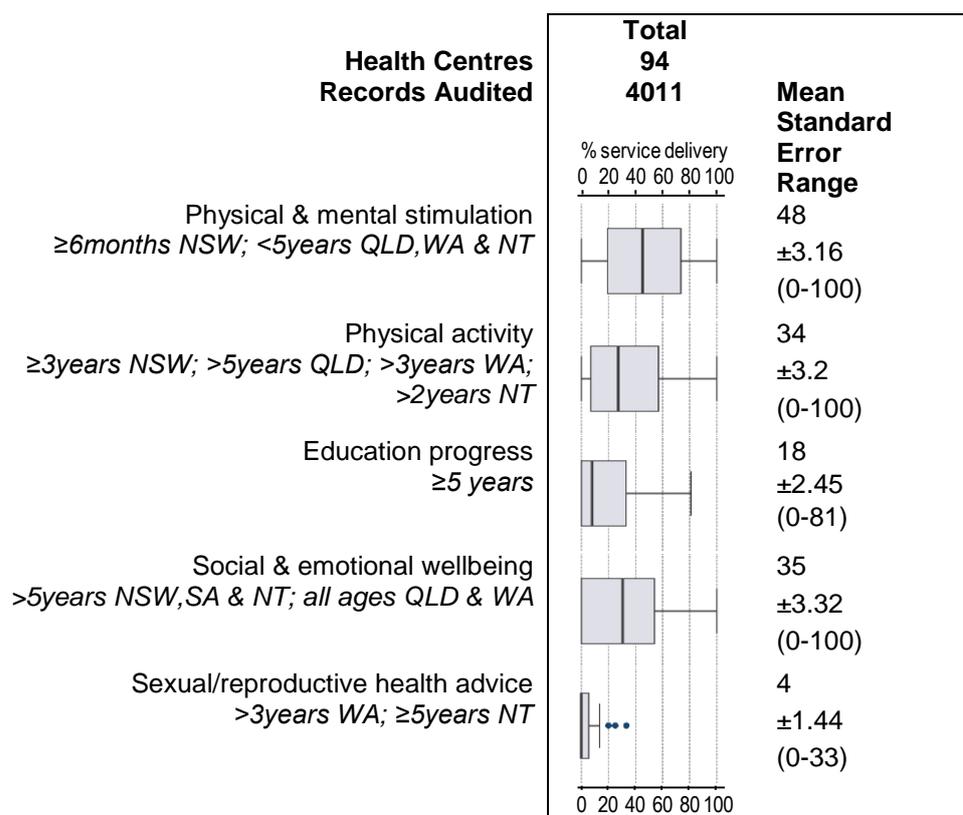
*Priorities for improvement on advice and brief interventions on common risks to health*

- Improve delivery and recording of advice on child nutrition – including on breastfeeding. Poor nutrition is an underlying factor for many aspects of poor child health. While social and environmental factors contribute to poor nutrition, it is important to provide appropriate advice to carers for providing the best possible diet for their children in any given situation. Many children do not have a record of relevant advice being provided, and there is wide variation between health centres in the proportion of children with a record of advice (Figure 1.5).

- Improve delivery and recording of advice to carers on the risks of passive smoking, infection prevention and hygiene, and injury prevention. Children in many communities live in houses where a number of adults smoke, and where they have high exposure to infection and injury due to environmental conditions. Recording of advice on these issues is generally low (Figure 1.5).

- Improve attention of clinical staff to domestic/social and environmental conditions, including food security, financial resources, housing conditions, social and family support. These conditions have important implications for clinical care of individual patients, as well as for the health of communities and populations. Recording of discussion on these issues is generally low (Figure 1.6).

- Improve attention of clinical staff to factors relevant to child development, including physical and mental stimulation, physical activity, social and emotional wellbeing, education progress. These factors contribute to, or may be reflective of, mental and physical health. Recording of discussion on these issues is generally low (Figure1.7).

## 1.7. Risk factors

Figure 8 shows boxplots and summary statistics of health centre percentages of child clients receiving a discussion on alcohol, tobacco or other harmful substances to identify at risk behaviours. Risk factor recording indicates that a discussion and/or education has been provided within the last 12 months. Different risk factor interventions apply to different age groups and jurisdictions as indicated in the figure.

***Figure 1.8*** ***Record of enquiry regarding use of cigarettes, alcohol and illicit drugs, and discussion and/or advice provided on their risks within the past 12 months: 2012-2013 (mean %, ±SE and range between health centres).***

| | Total | |
|---|---|---|
| **Health Centres** | **94** | |
| **Records Audited** | **4011** | **Mean** |
| | | **Standard** |
| | % service delivery | **Error** |
| | 0 20 40 60 80 100 | **Range** |
| Smoking | | 16 |
| *≥5 years* | | ±2.74 |
| | | (0-97) |
| Alcohol use | | 17 |
| *>10years QLD; ≥5 years NT* | | ±3.37 |
| | | (0-100) |
| Drug or substance use | | 15 |
| *≥8 years QLD; ≥5 years others states* | | ±3 |
| | | (0-100) |
| | 0 20 40 60 80 100 | |
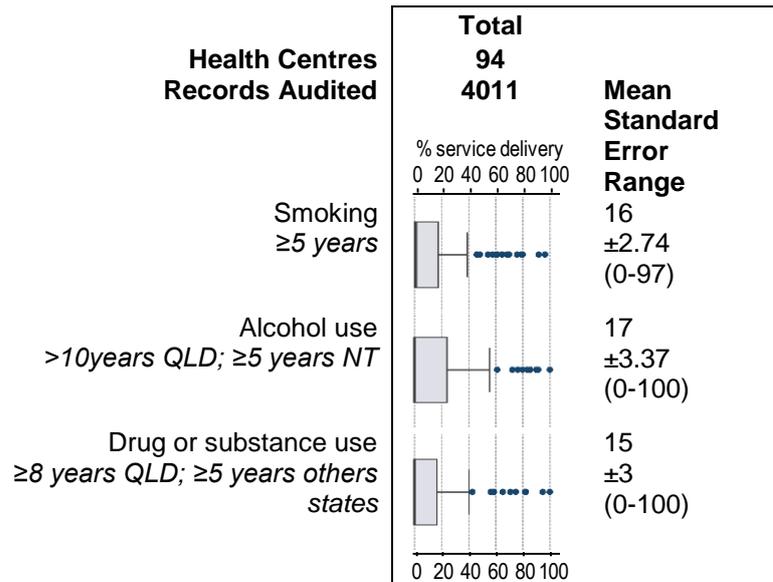
*Priorities for improvement in enquiry and advice on use of alcohol, tobacco, drugs*

- Improve enquiry - and recording of enquiry - regarding use of cigarettes, alcohol and illicit drugs, and discussion and/or advice provided on risks to children in the relevant age ranges. Many children do not have a record of relevant enquiry or advice being provided, and there is wide variation between health centres in the proportion of children with a record of advice (Figure1.8)

## 1.8. Follow-up of abnormal clinical findings

The following figures show boxplots and summary statistics of health centre percentages of child clients who receive follow-up action if a particular concern is noted within the last 12 months.

*Failure to thrive*

Failure to thrive is defined as a 'child whose weight is less than normal for gestational corrected age/gender and past medical history' (Primary Clinical Care Manual 6th ed 2009). Growth faltering is defined as 'a flattening or drop off of the growth curve following a period of steady growth' (CARPA, 5th ed 2009).

**Figure 1.9** *Record of follow-up actions if evidence of failure to thrive within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).*



| | | Total |
|---|---|---|
| **Health Centres** | | **94** |
| **Records Audited** | | **4011** |
| ***Total number of children with weight recorded*** | | ***3321*** |

% service delivery
0 20 40 60 80 100

Mean
Standard
Error
Range

| | | |
|---|---|---|
| **% Records with evidence of growth faltering/ failure to thrive** | | **13 ±2.01 (0-86)** |
| % Growth faltering with record of: | Clinical assessment | 77 ±3.42 (0-100) |
| | Follow-up check | 81 ±3.25 (0-100) |
| | Nutrition advice | 74 ±3.8 (0-100) |
| | Family meeting | 30 ±4.58 (0-100) |
| | Action plan made | 53 ±4.8 (0-100) |
| | Referral to support services | 39 ±4.76 (0-100) |
| | Other action | 40 ±5.31 (0-100) |

0 20 40 60 80 100

## Overweight and obesity

Overweight or obesity in childhood is defined as a body mass index (BMI) in the 85-95th percentile and >95th percentile respectively.

***Figure 1.10   Record of follow-up actions if overweight or obese within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).***



| | Total | Mean Standard Error Range |
|---|---|---|
| **Health Centres** | **94** | |
| **Records Audited** | **4011** | |
| ***Total number of children with BMI recorded*** | ***866*** | |
| **% Records with evidence of overweight/obesity** | | **7 ±1.73 (0-100)** |
| % Overweight/obese with record of: — Referral to dietician/Medical Officer | | 70 ±7.69 (0-100) |
| BP assessment | | 68 ±7.94 (0-100) |
| Blood glucose assessment | | 18 ±6.34 (0-100) |
| Blood lipid assessment | | 10 ±4.88 (0-100) |
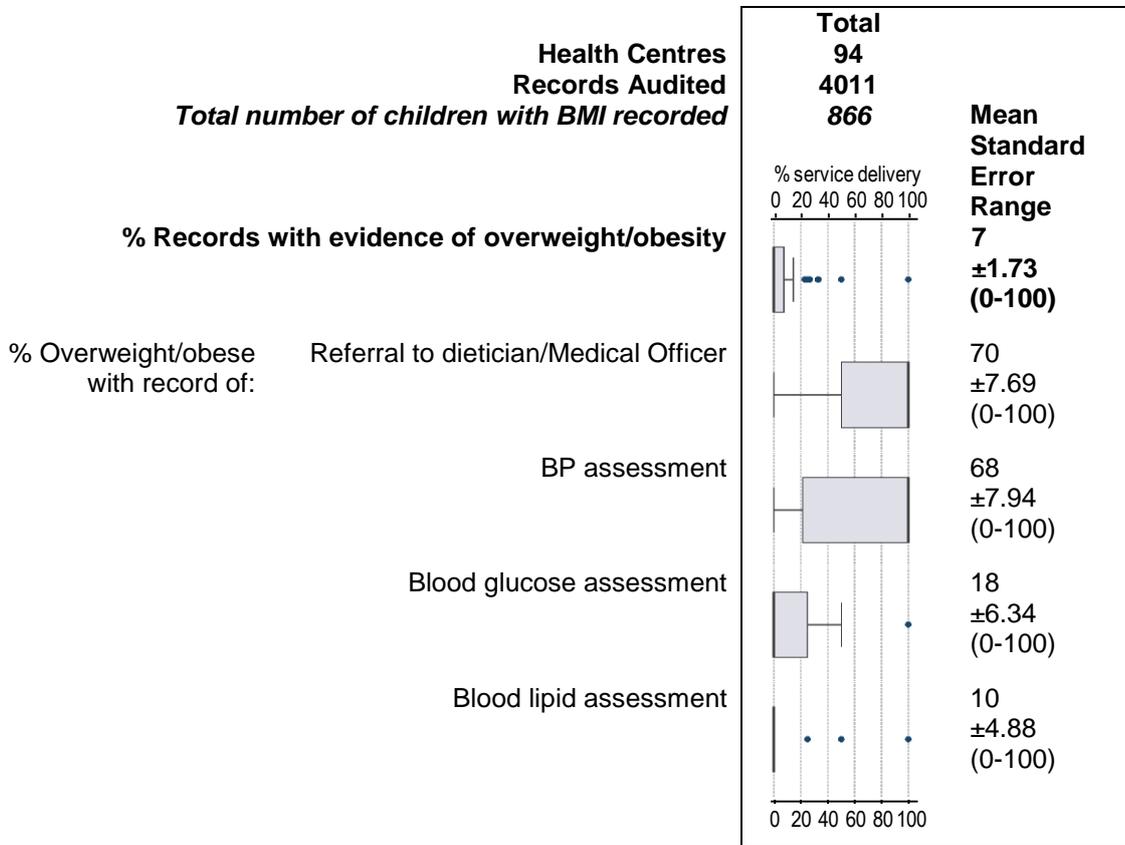
*Anaemia*

Anaemia is defined as <110g/L; or in Queensland:<105g/L for children aged 6-<12mths and <100g/L for children aged ≥12mths; or in the Northern Territory:<105g/L 6-<12mths, <110g/L 1-<5yrs,<115g/L 5-<8yrs, <119g/L 8-<12yrs, <118g/L 12-<15yrs female and <125g/L 12-<15yrs male.

**Figure 1.11** **Record of follow-up actions if evidence of anaemia within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).**

(NB: Haemoglobin tests only if indicated in each State/Territory.)
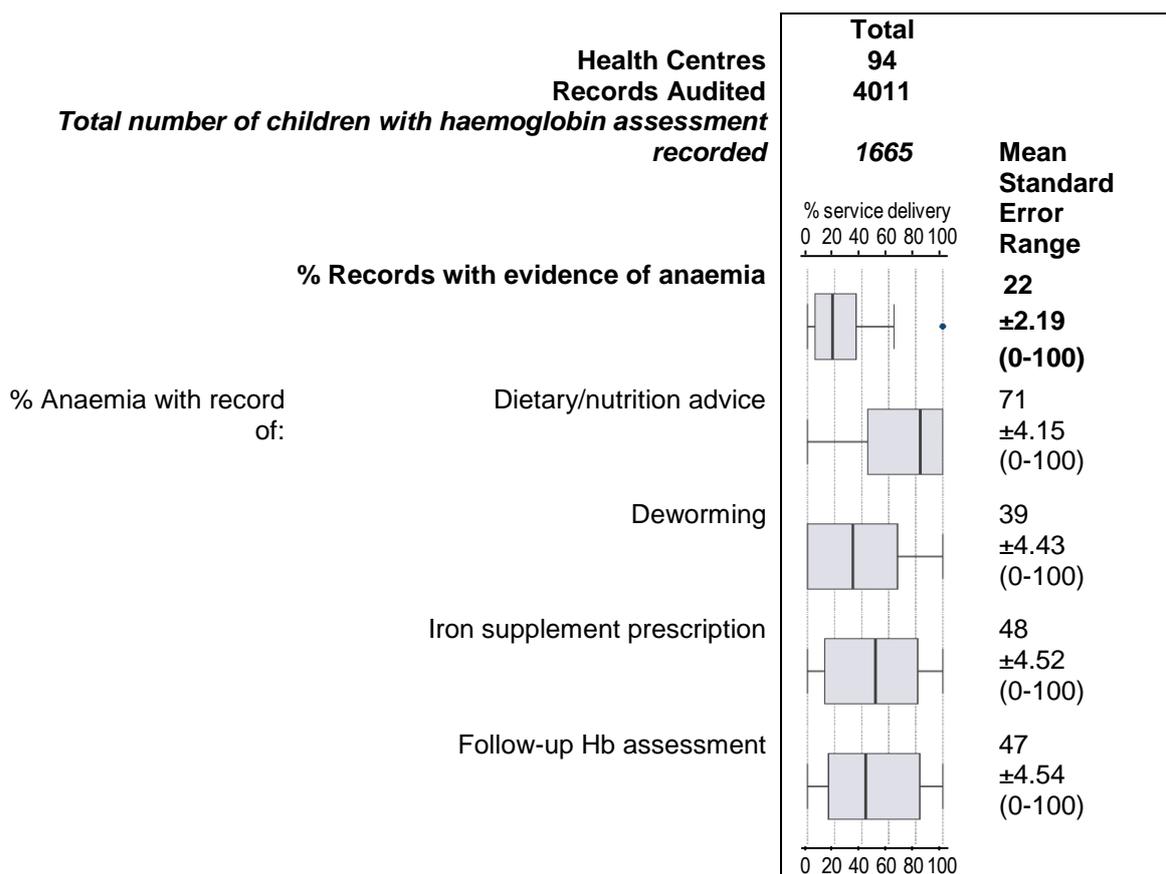
## Recurrent or chronic ear infection

Recurrent ear infections refer to two or more ear infections in the past year and chronic ear infections refers to ear infections persisting for two weeks or more in the past year.

**Figure 1.12** *Record of follow-up actions if evidence of recurrent or chronic ear infection within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).*



| | Total | Mean Standard Error Range |
|---|---|---|
| **Health Centres** | **94** | |
| **Records Audited** | **4011** | |
| *Total number of children with ear/hearing checks recorded* | *2938* | |
| **% Records with evidence of recurrent or chronic ear infection** | | **13 ±1.4 (0-58)** |
| % Recurrent or chronic ear infection with record of: Follow-up exam | | 92 ±2.1 (0-100) |
| Advice on ear care | | 77 ±3.67 (0-100) |
| Antibiotics prescription | | 92 ±2.32 (0-100) |
| Action plan made | | 57 ±4.76 (0-100) |
| Referral to audiology | | 53 ±4.55 (0-100) |
| Referral to ENT | | 50 ±4.69 (0-100) |
| Other action | | 46 ±4.62 (0-100) |

## Recurrent or chronic respiratory disease

Recurrent or chronic respiratory disease is defined as more than three episodes of chest infection requiring anti-biotics within the last 12 months. Respiratory disease can include asthma, slow lung growth, frequent coughs, pneumonia and bronchitis.

**Figure 1.13    Record of follow-up actions if evidence of recurrent or chronic respiratory disease within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).**

| | | Total |
|---|---|---|
| **Health Centres** | | **94** |
| **Records Audited** | | **4011** |
| ***Total number of children with respiratory exam recorded*** | | ***2610*** |

| | | Mean Standard Error Range |
|---|---|---|
| **% Records with chronic respiratory disease** | | **2 ±0.43 (0-25)** |
| **% Chronic respiratory disease with record of:** | Referral to paediatrician | 78 ±7.95 (0-100) |
| | Paediatric respiratory assessment report | 62 ±10.12 (0-100) |
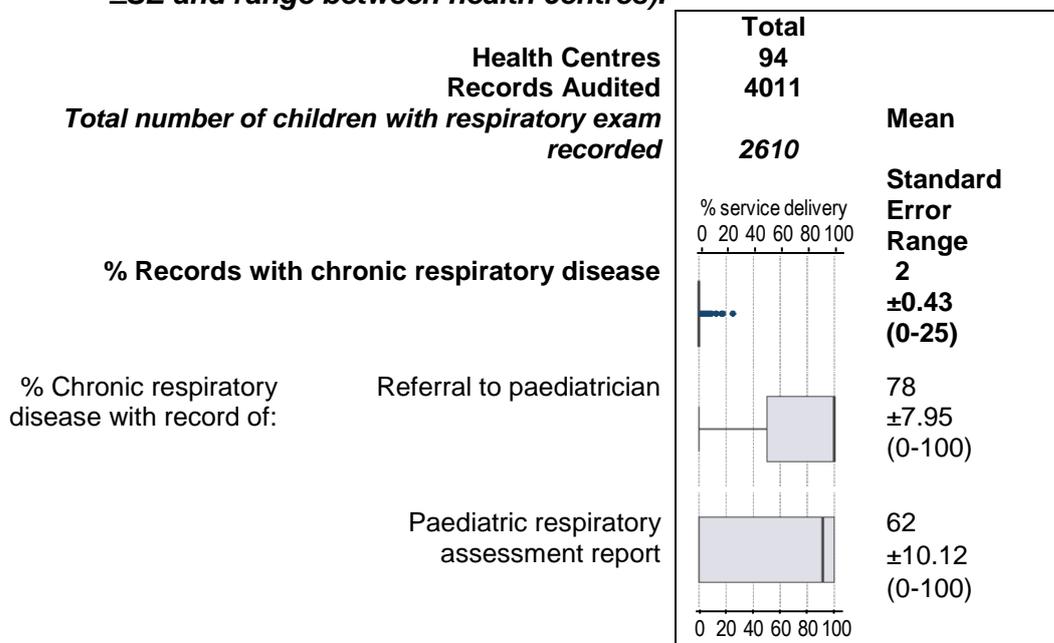


## Proteinuria

Evidence of proteinuria is defined as 1+ of protein or more in urinalysis check. Urinalysis check applies to children resident in Queensland (if indicated) or resident in the Northern Territory and ≥10 years.

**Figure 1.14    Record of follow-up actions if evidence of proteinuria within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).**

| | | Total |
|---|---|---|
| **Health Centres** | | **94** |
| **Records Audited** | | **4011** |
| ***Total number of children with urinalysis test recorded*** | | ***176*** |

| | | Mean Standard Error Range |
|---|---|---|
| **% Records with evidence of proteinuria** | | **25 ±5.13 (0-100)** |
| **% Proteinuria with record of:** | ACR | 62 ±9.87 (0-100) |
| | Follow-up by Medical Officer | 84 ±7.17 (0-100) |
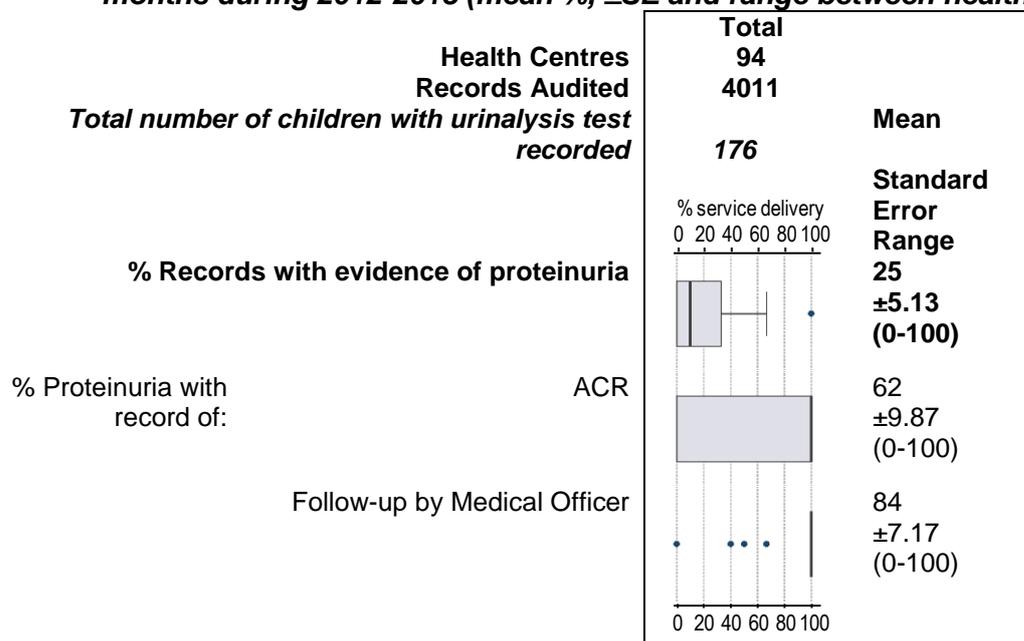
*Infected skin sores and scabies*

Infected skin sores refers to yellow-brown crusted sores that are often surrounded by redness and swelling and may include evidence of pus, discharge or bleeding.

***Figure 1.15*** ***Record of follow-up actions if infected skin sores or scabies within the past 12 months during 2012-2013 (mean %, ±SE and range between health centres).***



| | Total | Mean Standard Error Range |
|---|---|---|
| **Health Centres** | **94** | |
| **Records Audited** | **4011** | |
| *Total number of children with skin check recorded* | *2976* | |
| **% Records with evidence of infected skin sores** | | **25 ±1.65 (0-67)** |
| % Skin infections with record of: Cleaning/antibiotic treatment | | 94 ±1.59 (0-100) |
| Swabs taken | | 29 ±3.13 (0-100) |
| Follow-up check | | 66 ±3.43 (0-100) |
| **% Records with evidence of scabies** | | **15 ±1.24 (0-67)** |
| % Scabies with record of: Treatment | | 93 ±2.24 (0-100) |
| Follow-up check | | 60 ±4.12 (0-100) |
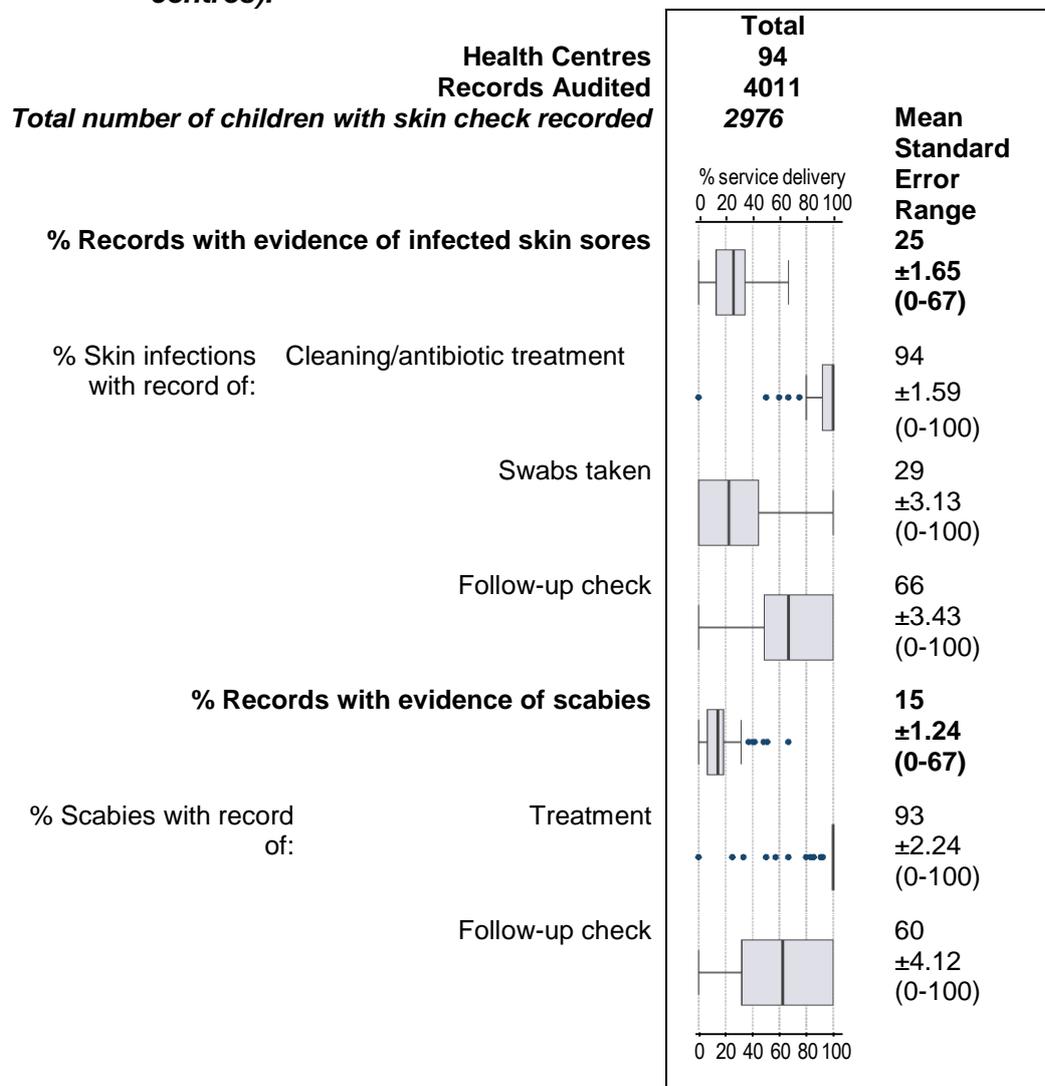
## Developmental delay, social and environmental risk factors

Developmental delay may relate to biological, psychological and sociocultural factors affecting infant development. Developmental delay can occur when milestone-specific tasks are not met. Concerns regarding domestic environment include living conditions generally, exposure to physical and emotional violence, substance misuse and gambling. Concerns over housing and food security include overcrowding, access to clean water and access to nutritious food on a regular and reliable basis.

**Figure 1.16** **Record of follow-up actions if concern regarding developmental, social or environmental factors within the past 12 months for 2012-2013 (mean %, ±SE and range between health centres).**



| | | Total | |
|---|---|---|---|
| **Health Centres** | | **94** | |
| **Records Audited** | | **4011** | **Mean** |
| | | | **Standard** |
| | | % service delivery | **Error** |
| | | 0 20 40 60 80 100 | **Range** |
| **% Records with evidence of developmental delay** | | | **4** **±0.57** **(0-27)** |
| % Evidence of developmental delay with record of: | Referral | | 79 ±4.54 (0-100) |
| | Follow-up | | 79 ±4.5 (0-100) |
| **% Records with evidence of concern over domestic environment** | | | **4** **±0.74** **(0-41)** |
| % Concern over domestic environment with record of: | Referral | | 71 ±5.25 (0-100) |
| | Follow-up | | 63 ±5.86 (0-100) |
| **% Records with evidence of concern over financial situation** | | | **2** **±0.6** **(0-47)** |
| % Concern over financial situation with record of: | Referral | | 81 ±6.01 (0-100) |
| | Follow-up | | 70 ±6.86 (0-100) |

***Figure 1.16 (cont): Record of follow-up actions if concern regarding developmental, social or environmental factors within the past 12 months for 2012-2013 (mean %, ±SE and range between health centres).***

| | | Total |
|---|---|---|
| **Health Centres** | | **94** |
| **Records Audited** | | **4011** |
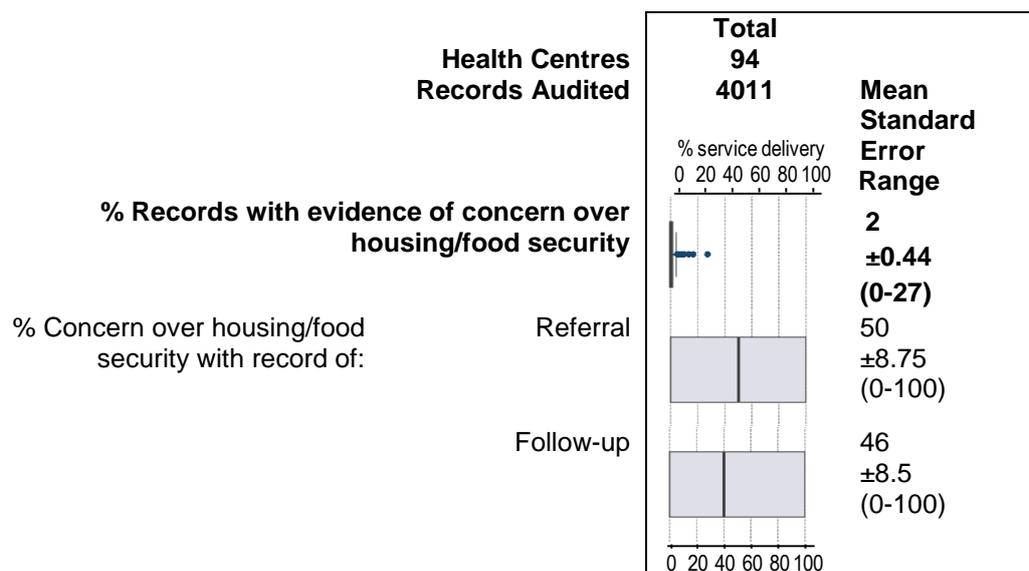


Priorities for improvement in follow-up of abnormal clinical findings and identified risks to health

- Improve recording of ***growth faltering/failure to thrive***. Growth faltering/failure to thrive is a key indicator of poor and deteriorating health in children, and should prompt investigation and action. There is wide variation between jurisdictions and between health centres in the proportion of children with a record of growth faltering or failure to thrive, with records being much less than would be expected from other evidence on the population incidence of these conditions (Figure1.9).

- Improve follow-up action for children identified with growth faltering or failure to thrive. There is a wide variation between health centres in the recording of follow-up action, and generally low levels of recording of systematic actions being taken for these children – including clinical assessment, development of an action plan, or referral to support services (Figure 1.9).

- Review guidelines for screening and case finding for ***anaemia*** in children. There is wide variation between health centres in the proportion of children with a record of anaemia, with records being lower in some health centres than would be expected from other evidence on the population incidence of anaemia. This indicates that in many areas anaemia may not be detected because of lack of clarity and/or inappropriate guidelines, which will compromise systematic and appropriate approaches to screening and case finding (Figure 1.11).

- Improve follow-up action for children identified with anaemia. There is a wide variation between health centres in the recording of follow-up action, and generally low levels of recording of systematic actions being taken for these children – including deworming, prescription of iron supplements, nutritional advice, and follow-up monitoring of haemoglobin (Figure 1.11).

- Improve recording of ***chronic ear infections***. Chronic ear infections are common in many Aboriginal and Torres Strait islander communities, and can have serious consequences for children's development. There is wide variation between health centres in the proportion of children with a record of chronic ear infection, with records being much less than would be expected from other evidence on the population incidence of such infections (Figure 1.12).

- Improve follow-up action for children with chronic ear infections. There is a wide variation between health centres in the recording of follow-up action, and generally low levels of recording of systematic actions being taken for these children – including follow-up examination, advice on ear care, development of an action plan, or referral to an ENT specialist (Figure 1.12).

- Improve recording of **evidence of developmental delay, and concerns over the domestic environment, financial situation, housing and food security**. There is wide variation between health centres in the proportion of children with a record of such evidence or concerns, with records being much less than would be expected from other evidence on the population prevalence of such conditions (Figure 1.16).

- Review and improve systems and services for referral and follow-up support for children who are identified with developmental delay or who are living in poor social or environmental conditions. There is wide variation between health centres in the proportion of children with a record of referral or follow-up for such children (Figure 1.16).

## 1.9.    Health centre systems

The data presented in Figure 1.17 are from the subset of 94 health centres that undertook a systems assessment in 2012 or 2013.

Scores for each system component, aggregated for all health centres nationally, are shown in the radar plot below.

***Figure 1.17    Radar plot showing median, 20th and 80th percentiles\* of aggregated system component scores as assessed by health centres (n=62) nationally in 2012-2013.***
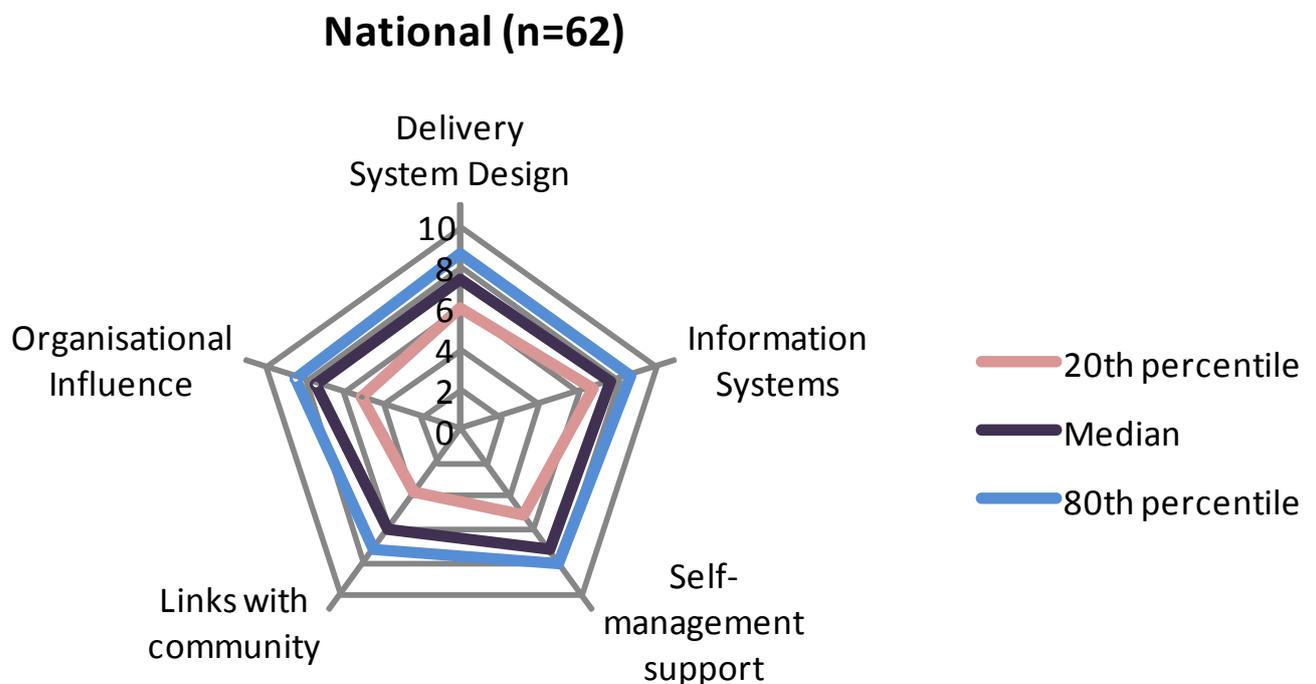
Nationally, the system components for which the median score was relatively high were: Organisational Influence; Delivery System Design; and Information Systems (Figure 1.17). The system component for which the median score was relatively low was Links with the Community. The 20th centile for Links to the Community was also relatively low, indicating that the health centre teams for 20% of services gave this system component a score of less than 4 out of 11.

Scores for the individual items within each system component, aggregated for all health centres nationally, are shown in Table 1.4 below.

Nationally, the median scores for individual items for all health centres nationally ranged between 4.5 and 9, with the lowest score being for Regional Health Planning, and the highest score being for evidence-based Guidelines (Table1. 4). More importantly, there is a wide range between health centres on scores for all individual items. The range between the highest and lowest scores for each item extends from 0 or 1 up to the maximum of 11 for the majority of items. For many items, the range between the 20th centile and the 80th centile is 4 or 5 points.

*Table 1.3. Aggregated individual item scores for each system component as assessed by health centres nationally (n=62) in 2012-2013.*

| Component | Item | Min | 20th percentile | Median | 80th percentile | Max |
|---|---|---|---|---|---|---|
| **Delivery System Design** (overall median 7.4) | Team structure and function | 1 | 4 | 8 | 9 | 11 |
| | Clinical Leadership | 0 | 5 | 8 | 10 | 11 |
| | Appointments and scheduling | 2 | 6 | 8 | 9 | 11 |
| | Care Planning | 2 | 6 | 8 | 9 | 11 |
| | Systematic approach to follow-up | 1 | 7 | 8 | 9 | 11 |
| | Continuity of care | 2 | 5 | 7 | 9 | 11 |
| | Client access/cultural competence | 2 | 6 | 8.5 | 10 | 11 |
| | Physical infrastructure | 1 | 5 | 7 | 9 | 11 |
| **Information systems and decision support** (overall median 7.7) | Maintenance and use of electronic client list | 0 | 5 | 8 | 9 | 11 |
| | Evidence based guidelines | 3 | 7 | 9 | 10 | 11 |
| | Specialist and generalist collaborations | 1 | 5 | 8 | 9 | 11 |
| **Self-management support** (overall median 7.3) | Assessment and documentation | 1 | 5 | 7 | 9 | 11 |
| | Self-management education and support | 1 | 6 | 7 | 8 | 11 |
| **Links with community** (overall median 6.0) | Communication and cooperation on governance and operation | 1 | 4 | 5 | 7 | 11 |
| | Linking clients to outside resources | 1 | 4 | 7 | 9 | 11 |
| | Working out in community | 0 | 4 | 6 | 8 | 11 |
| | Regional health planning | 0 | 2 | 4.5 | 7 | 9 |
| **Organisational influence & integration** (overall median 7.3) | Organisational commitment | 0 | 4 | 6 | 8 | 11 |
| | Quality improvement strategies | 0 | 6 | 8 | 9 | 11 |
| | Integration of health system components | 0 | 4 | 7 | 9 | 11 |

*Priorities for system improvements to enable health centres to provide high quality child health services*

- Strengthening systems for more effective links between health centres and communities is a potential priority area for action, particularly in health centres with relatively lower scores in this area (Table 1.4).
- Improvement of systems to support regional health planning activities appears to be an area of particular need. Good regional planning systems, including community input, is important for coordinated delivery of community and health services that meet the needs of the population (Table 1.4).
- There appears to be a need to work with health centre teams to strengthen systems in general in those health centres with relatively low scores. As a starting point, it may be appropriate to focus on supporting health centres that have scores in the lowest 20%, with a particular focus on those items with the lowest scores (Table 1.4).

## 2. Phase 2 report: Trends over time for key indicators of priority evidence-practice gaps

The data presented in this appendix is from the Phase 2 child health report '*Trends over time: key indicators of priority evidence-practice gaps in child health 2007 – 2013.'* This report is available on request.

This report presented audit data on trends in key indicators relevant to the priority evidence-practice gaps to assist stakeholders in identifying barriers and enablers to addressing the evidence-practice gaps.

### 2.1. Participating health centres and characteristics of children

The data presented in this appendix are from health centres that conducted child health audits between 2007 and 2013. In total 132 health centres participating in the ABCD Partnership had relevant data over this period, with the largest number of health centres being in the NT and Qld. The number of health centres with data for each year increased from 21 in 2007 to over 80 in 2011 and 2012, and declined to 68 in 2013 (Table 2.1). There were 71 health centres that had conducted at least three audit cycles, with a small number that had conducted six or seven cycles (Table 2.2). Overall 80% of health centres were in remote locations and 75% were government managed (Table 2.3).

The data presented are limited to aspects of care relevant to children less than 6 years of age, as the child health audit tool was only extended to older children in 2011. As expected from the age stratified sampling process there were even numbers of boys and girls, with 90% of audited records being for Aboriginal or Torres Strait Islander children. For most years, 95% or more of audited records showed a record of at least one attendance within the 12 months preceding the audit date, with the most common reason for last attendance being for acute care (Table 2.3).

**Table 2.1** *Child health audit and systems assessment completed between 2007-2013 (number of child health records audited, number of health centres and number of SATs)*

| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
|---|---|---|---|---|---|---|---|---|---|
| FWNSW | #Audits | 162 | 163 | 159 | 147 | 174 | 184 | 178 | 1,167 |
| | #Centres | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 6 |
| | #SATs | 6 | 6 | 6 | 0 | 0 | 0 | 0 | 18 |
| NT | #Audits | 313 | 412 | 314 | 193 | 722 | 885 | 778 | 3,617 |
| | #Centres | 12 | 14 | 13 | 7 | 30 | 32 | 28 | 59 |
| | #SATs | 7 | 12 | 7 | 7 | 20 | 18 | 18 | 89 |
| QLD | #Audits | | 103 | 325 | 577 | 1,512 | 1,187 | 958 | 4,662 |
| | #Centres | | 4 | 13 | 23 | 45 | 41 | 34 | 52 |
| | #SATs | | 4 | 8 | 17 | 40 | 39 | 26 | 134 |
| SA | #Audits | | | | | 77 | 165 | | 242 |
| | #Centres | | | | | 2 | 4 | | 5 |
| | #SATs | | | | | 3 | 0 | | 3 |
| WA | #Audits | 90 | 239 | 178 | 60 | 60 | 30 | 60 | 717 |
| | #Centres | 3 | 8 | 6 | 2 | 2 | 1 | 2 | 10 |
| | #SATs | 1 | 8 | 6 | 2 | 2 | 1 | 1 | 21 |
| Total | #Audits | 565 | 917 | 976 | 977 | 2,545 | 2,451 | 1,974 | 10,405 |
| | #Centres | 21 | 32 | 38 | 36 | 83 | 82 | 68 | 132 |
| | #SATs | 14 | 30 | 27 | 26 | 65 | 58 | 45 | 265 |

**Table 2.2** *Child health audit completed between 2007 and 2013 by audit cycle (number of child health records audited and number of health centres)*

| | | Cycle | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| FWNSW | #Audits | 162 | 163 | 159 | 147 | 174 | 184 | 178 | 1,167 |
| | #Centres | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 6 |
| NT | #Audits | 1,585 | 1,087 | 586 | 222 | 109 | 28 | | 3,617 |
| | #Centres | 59 | 41 | 24 | 8 | 5 | 2 | | 59 |
| QLD | #Audits | 1,562 | 1,184 | 1,086 | 659 | 171 | | | 4,662 |
| | #Centres | 52 | 42 | 38 | 24 | 6 | | | 52 |
| SA | #Audits | 148 | 94 | | | | | | 242 |
| | #Centres | 5 | 1 | | | | | | 5 |
| WA | #Audits | 299 | 178 | 90 | 60 | 60 | 30 | | 717 |
| | #Centres | 10 | 6 | 3 | 2 | 2 | 1 | | 10 |
| Total | #Audits | 3,756 | 2,706 | 1,921 | 1,088 | 514 | 242 | 178 | 10,405 |
| | #Centres | 132 | 96 | 71 | 38 | 17 | 7 | 4 | 132 |

**Table 2.3 Characteristics of participating health centres and children's records audited between 2007 & 2013 (number & %)**

| Primary Health Care Centres | | 2007 21 | | 2008 32 | | 2009 38 | | 2010 36 | | 2011 83 | | 2012 82 | | 2013 68 | | Overall 132 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Location** | Urban | 0 | 0% | 3 | 9% | 1 | 3% | 1 | 3% | 2 | 2% | 3 | 4% | 2 | 3% | 8 | 6% |
| | Regional | 6 | 29% | 7 | 22% | 6 | 16% | 2 | 6% | 9 | 11% | 8 | 10% | 7 | 10% | 19 | 14% |
| | Remote | 15 | 71% | 22 | 69% | 31 | 82% | 33 | 92% | 72 | 87% | 71 | 87% | 59 | 87% | 105 | 80% |
| **Governance** | Government | 6 | 29% | 12 | 38% | 20 | 53% | 26 | 72% | 67 | 81% | 66 | 80% | 57 | 84% | 99 | 75% |
| | Community Controlled | 15 | 71% | 20 | 63% | 18 | 47% | 10 | 28% | 16 | 19% | 16 | 20% | 11 | 16% | 33 | 25% |
| **Size of** | ≤500 | 7 | 33% | 8 | 25% | 10 | 26% | 14 | 39% | 41 | 49% | 39 | 48% | 37 | 54% | 59 | 45% |
| **population** | 501-999 | 5 | 24% | 7 | 22% | 9 | 24% | 7 | 19% | 15 | 18% | 21 | 26% | 10 | 15% | 24 | 18% |
| **served** | ≥1000 | 9 | 43% | 17 | 53% | 19 | 50% | 15 | 42% | 27 | 33% | 22 | 27% | 21 | 31% | 49 | 37% |
| **Duration of** | <1 year | 21 | 100% | 14 | 44% | 11 | 29% | 12 | 33% | 46 | 55% | 19 | 23% | 6 | 9% | 36 | 27% |
| **participation in** | 1-2 years | 0 | 0% | 18 | 56% | 27 | 71% | 19 | 53% | 23 | 28% | 43 | 52% | 35 | 51% | 58 | 44% |
| **ABCD CQI** | ≥3 years | 0 | 0% | 0 | 0% | 0 | 0% | 5 | 14% | 14 | 17% | 20 | 24% | 27 | 40% | 38 | 29% |
| **Number of audited records** | | 565 | | 917 | | 976 | | 977 | | 2,545 | | 2,451 | | 1,974 | | 10,405 | |
| **Age Groups** | <1 year | 172 | 30% | 253 | 28% | 287 | 29% | 239 | 24% | 560 | 22% | 511 | 21% | 452 | 23% | 2474 | 24% |
| | 1-<3 years | 207 | 37% | 327 | 36% | 327 | 34% | 353 | 36% | 947 | 37% | 929 | 38% | 751 | 38% | 3841 | 37% |
| | 3-<6 years | 186 | 33% | 337 | 37% | 362 | 37% | 385 | 39% | 1038 | 41% | 1011 | 41% | 771 | 39% | 4090 | 39% |
| **Gender** | Males | 287 | 51% | 464 | 51% | 479 | 49% | 486 | 50% | 1285 | 50% | 1217 | 50% | 993 | 50% | 5211 | 50% |
| | Females | 278 | 49% | 453 | 49% | 497 | 51% | 491 | 50% | 1260 | 50% | 1234 | 50% | 981 | 50% | 5194 | 50% |
| **Indigenous** | Indigenous | 507 | 90% | 840 | 92% | 899 | 92% | 893 | 91% | 2298 | 90% | 2203 | 90% | 1759 | 89% | 9399 | 90% |
| **status** | Non-indigenous | 50 | 9% | 61 | 7% | 53 | 5% | 58 | 6% | 184 | 7% | 194 | 8% | 180 | 9% | 780 | 7% |
| | Not stated | 8 | 1% | 16 | 1.7% | 24 | 2% | 26 | 3% | 63 | 2% | 54 | 2% | 35 | 2% | 226 | 2% |
| **Attended within past 12 months** | | 535 | 95% | 841 | 92% | 912 | 93% | 940 | 96% | 2462 | 97% | 2363 | 96% | 1932 | 98% | 9985 | 96% |
| **Reason for last** | Acute care | 265 | 47% | 480 | 52% | 486 | 50% | 449 | 46% | 1372 | 54% | 1142 | 47% | 944 | 48% | 5138 | 49% |
| **attendance** | Child Health Check | 130 | 23% | 170 | 19% | 181 | 19% | 194 | 20% | 525 | 21% | 569 | 23% | 499 | 25% | 2268 | 22% |
| | Immunisation | 85 | 15% | 123 | 13% | 151 | 15% | 193 | 20% | 411 | 16% | 483 | 20% | 327 | 17% | 1773 | 17% |
| | Other | 85 | 15% | 144 | 16% | 158 | 16% | 141 | 14% | 237 | 9% | 257 | 10% | 204 | 10% | 1226 | 12% |
| **Profession child** | AHW | 108 | 19% | 180 | 20% | 184 | 19% | 188 | 19% | 439 | 17% | 480 | 20% | 232 | 12% | 1811 | 17% |
| **first seen by** | Nurse | 290 | 51% | 493 | 54% | 589 | 60% | 535 | 55% | 1663 | 65% | 1625 | 66% | 1362 | 69% | 6557 | 63% |
| | GP | 130 | 23% | 167 | 18% | 97 | 10% | 121 | 12% | 273 | 11% | 210 | 9% | 273 | 14% | 1271 | 12% |
| | Specialist | 6 | 1% | 16 | 2% | 8 | 0.8% | 15 | 2% | 35 | 1% | 35 | 1% | 47 | 2% | 162 | 2% |
| | Allied Health | 2 | 0.4% | 5 | 0.5% | 6 | 0.6% | 13 | 1% | 36 | 1% | 32 | 1% | 28 | 1% | 122 | 1% |
| | Other | 3 | 0.5% | 12 | 1% | 11 | 1% | 17 | 2% | 33 | 1% | 24 | 1% | 24 | 1% | 124 | 1% |
| | Not stated | 26 | 5% | 44 | 5% | 81 | 8% | 88 | 9% | 66 | 3% | 45 | 2% | 8 | 0.4% | 358 | 3% |

## 2.2.    Presentation of data

Audit data on indicators relevant to the identified evidence-practice gaps in child health services are presented over time in two ways - by year and by audit cycle.

The presentation of data **by year** includes the data for all health centres participating in the ABCD National Research Partnership, and provides an indication of influences on clinical performance that may be occurring at different times in the general health system environment. This 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.

The presentation of data **by audit cycle** includes the data for health centres that have conducted child health audits in at least three audit cycles. The presentation of data by audit cycle 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. We have limited the presentation of data to a maximum of five audit cycles because there were limited numbers of services that had conducted more than five child health audit cycles.

*Interpretation of box plots*

An important focus of the ABCD National Research Partnership is on understanding variation in delivery of care in accordance with best practice guidelines between health centres and variation over time. '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 of the data.

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. The mean percentages for all relevant health centres are displayed in box plots to show the distribution or range in recorded delivery of care.

Box and whisker plots show:

- the values for the health centres with the minimum and maximum mean percentage in recorded delivery of care in accordance with best practice guidelines (ends of whiskers if no outliers);
- outliers – these are values that are far away from most other scores in the data set (or a distance that is greater than 1.5 times the length of the box);
- the range between health centres in recorded delivery of care. This is shown 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 '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 (or variation) between health centres.
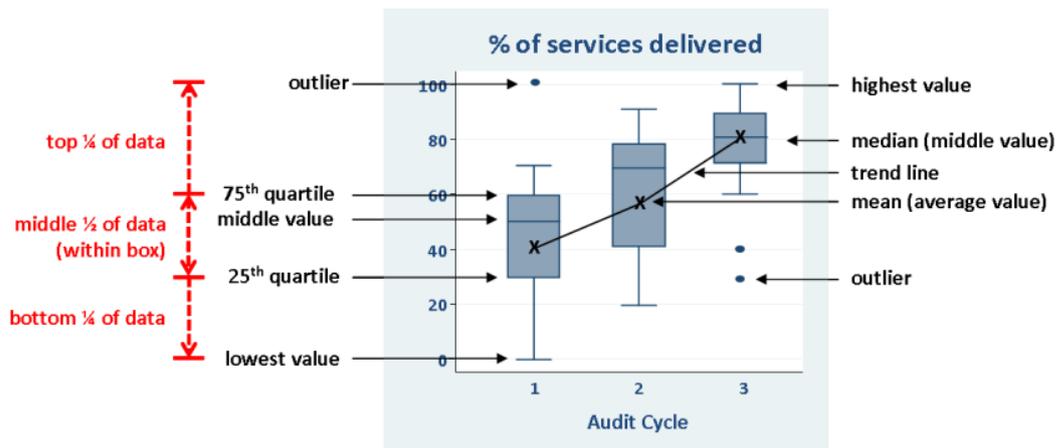
In assessing the trends in indicators relevant to the priority evidence practice gaps, it is helpful to focus on:

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, and importantly, whether there is an improvement in the values for the health centres at the lower end of the range.

## 2.3.    Overall child health delivery

Feedback on the report on priority evidence-practice gaps highlighted the importance of continuing attention to holistic care, and ensuring that attention to the priority evidence-practice gaps did not detract from the importance of providing high quality care across the scope of best practice in child health. The figures below show trends in a composite indicator of overall delivery of care* in accordance with best practice guidelines.

There is an overall increase in overall delivery of care between 2007 and 2013 (Figure 2.1). The dip in 2011 coincides with a large increase in the number of services that conducted child health audits.  The variation between health centres was fairly consistent over the years 2007 to 2013.

For health centres that had completed three or more audit cycles, there is an overall increase in delivery of care in line with best practice guidelines in successive audit cycles (Figure 2.2). There is also a narrowing in the variation across health centres in the 4th and 5th audit cycles, with a notable improvement in the health centres with the lowest levels of overall delivery of care.
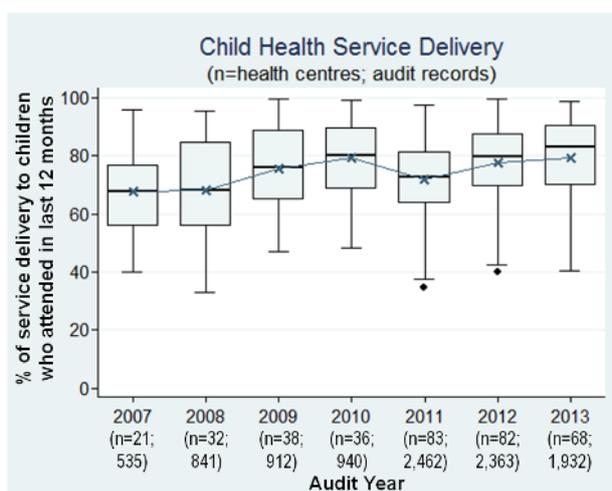


Figure 2.1   *Mean percent child health delivery\* to children who attended in previous 12 months, by audit year for all health centres (n=number of health centres; number of children records audited who attended in previous 12 months).*
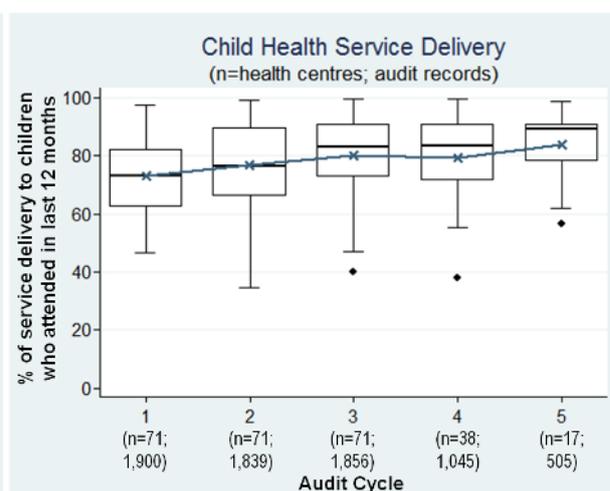
Figure 2.2   *Mean percent child health delivery\* to children who attended in previous 12 months, by audit cycle for health centres that have at least three years of audit data (n=number of health centres; number of children records audited who attended in previous 12 months)*

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* includes ten best practice indicators present in the child health audit tool over time and across jurisdictions (weight, height, head circumference, hip exam, testes check, ear exam, breastfeeding, nutrition advice, SIDS prevention, and developmental check).

## 2.4.    Immunisations

In summary, there was some indication of improvement in systematic recording of immunisations and in the delivery of immunisations scheduled for delivery at 2 years and older, but no indication of improvement in recording of delivery of immunisations scheduled for delivery at birth.

*Figure 2.3  Mean percent of children with 1) an immunisation chart present, 2) recorded hepatitis B immunisation at birth and 3) MMR (measles, mumps, rubella) immunisation at 4 years of age, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children records audited).*

**A3)**



MMR Immunisation at 4 years
(n=health centres; audit records)

**B3)**



MMR Immunisation at 4 years
(n=health centres; audit records)
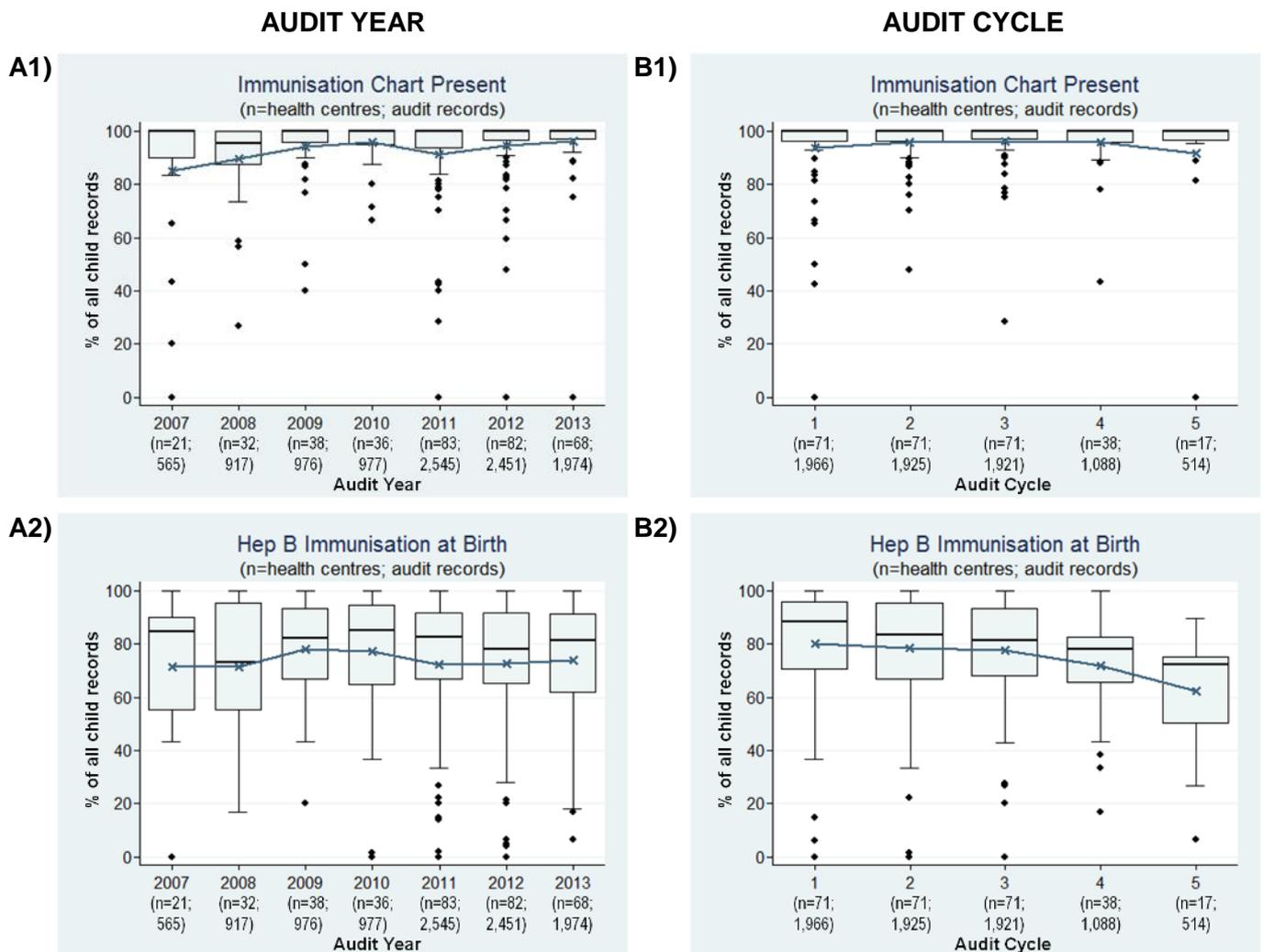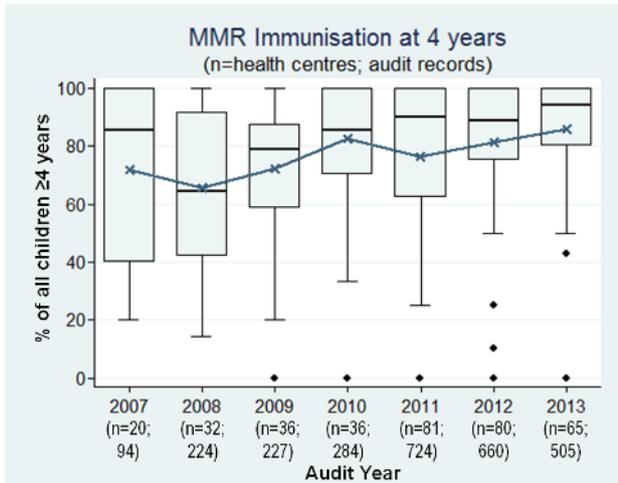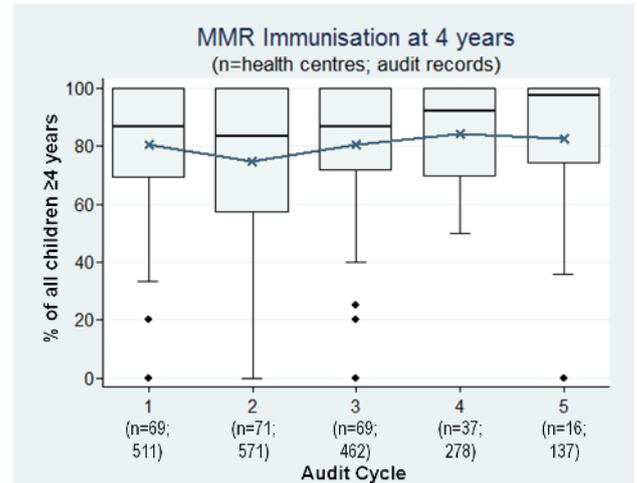
## 2.5. Clinical examinations and follow-up of abnormal findings

*Recording of weight and growth faltering*

In summary, there is an improving trend in recording of weight, but no clear reduction in variation between health centres over years and across successive audit cycles. While there is no clear reduction in variation between health centres in recording growth faltering over years, there is a reduction in variation for health centres that completed three or more audit cycles.

**Figure 2.4** *Mean percent of children with a record of attendance within the previous 12 months who 1) had weight recorded and 2) had evidence of growth faltering, by A) audit year for all health centres and B) by audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children with a record of attendance in previous 12 months).*

**AUDIT YEAR**

**AUDIT CYCLE**

**A1)**



Weight Recorded
(n=health centres; audit records)

**B1)**



Weight Recorded
(n=health centres; audit records)

**A2)**



**B2)**
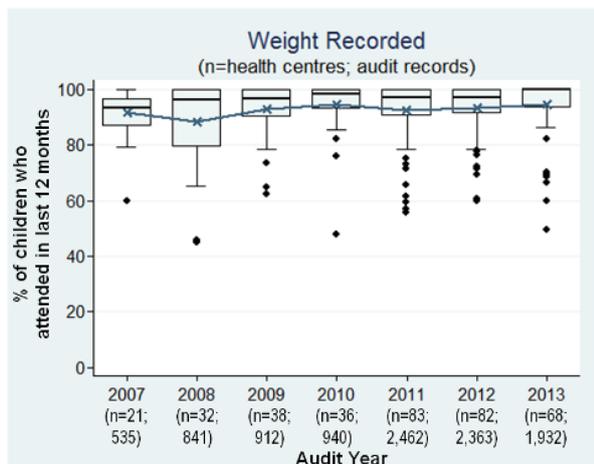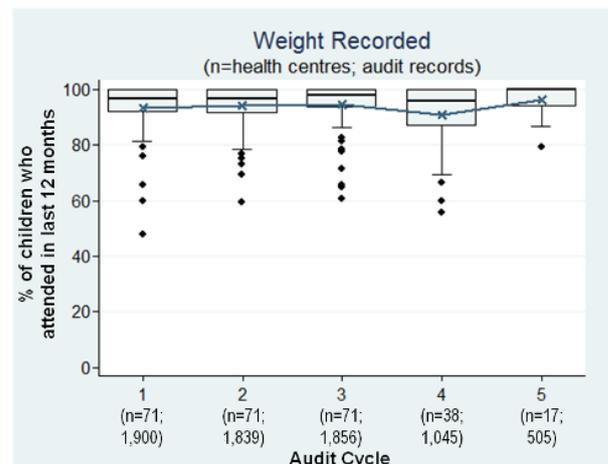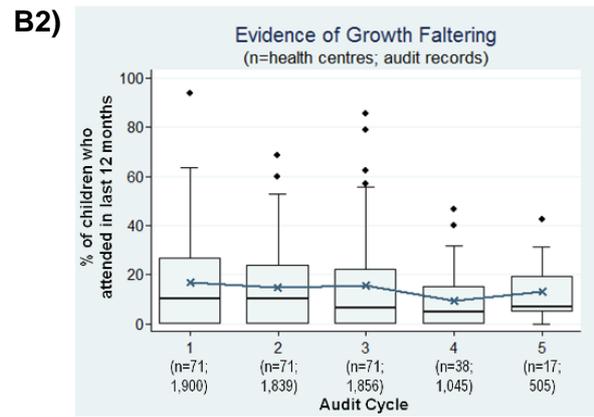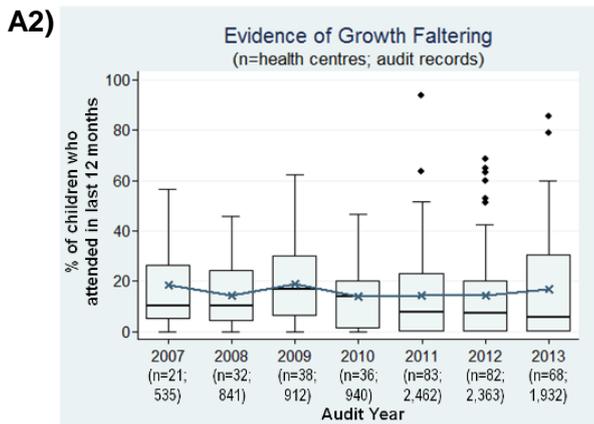


***Figure 2.5*** ***Mean percent of children with weight recorded who had documented evidence of growth faltering, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited who had weight recorded).***

**AUDIT YEAR**

**AUDIT CYCLE**

**A)**



**B)**
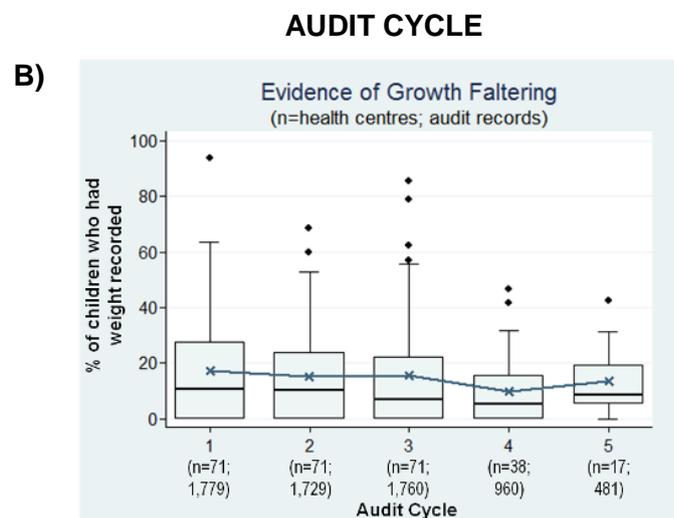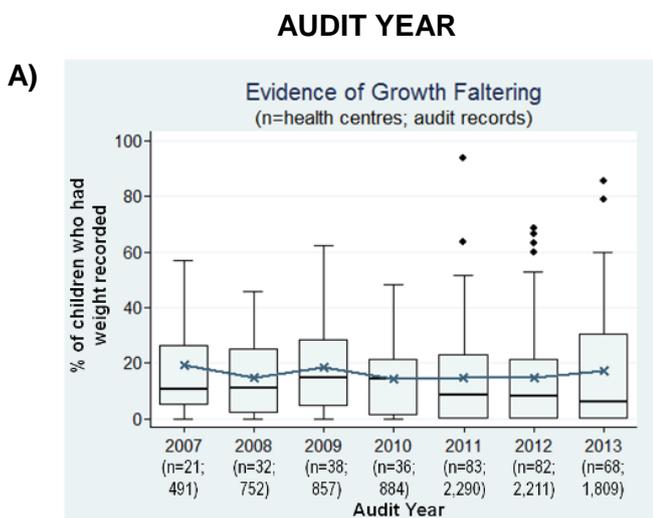


***Table 2.4 Mean, median and range for the number of children's records a) audited; b) with a weight recorded within the previous year; and c) with documented evidence of growth faltering, by audit year for all participating health centres.***

| Year | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| **Number of Health Centres** | | **21** | **32** | **38** | **36** | **83** | **82** | **68** |
| **Number of audit records** | Mean | 26.9 | 28.7 | 25.7 | 27.1 | 30.7 | 29.9 | 29.0 |
| | *Median* | *30* | *30* | *29.5* | *28* | *30* | *26* | *22.5* |
| | (Range) | (15-30) | (12-53) | (8-30) | (7-60) | (6-90) | (6-94) | (5-98) |
| **Weight Recorded** | Mean | 23.4 | 23.5 | 22.6 | 24.6 | 27.6 | 27.0 | 26.6 |
| | *Median* | *25* | *22.5* | *23.5* | *25.5* | *24* | *24* | *20* |
| | (Range) | (12-30) | (9-52) | (7-30) | (7-57) | (5-88) | (5-84) | (5-89) |
| **Evidence of Growth Faltering** | Mean | 4.8 | 4.1 | 4.3 | 3.6 | 3.8 | 3.9 | 4.3 |
| | *Median* | *3* | *3* | *3* | *3* | *2* | *2* | *2* |
| | (Range) | (0-16) | (0-16) | (0-10) | (0-14) | (0-20) | (0-25) | (0-19) |

***Table 2.5 Mean, median and range of the number of children's records a) audited; b) with a weight recorded within the previous year; and c) with documented evidence of growth faltering, by audit cycle for health centres that have at least three years of audit data.***

| Audit Cycle | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Number of Health Centres | | 71 | 71 | 71 | 38 | 17 |
| **Number of audit records** | **Mean** | **27.7** | **27.1** | **27.1** | **28.6** | **30.2** |
| | *Median* | *29* | *27* | *27* | *26* | *30* |
| | *(Range)* | *(8-90)* | *(8-72)* | *(6-98)* | *(5-61)* | *(10-63)* |
| **Weight Recorded** | **Mean** | **25.1** | **24.4** | **24.8** | **25.3** | **28.3** |
| | *Median* | *25* | *23* | *23* | *24* | *27* |
| | *(Range)* | *(7-88)* | *(6-57)* | *(5-85)* | *(5-54)* | *(10-59)* |
| **Evidence of Growth Faltering** | **Mean** | **4.2** | **3.7** | **3.7** | **2.7** | **3.2** |
| | *Median* | *2* | *3* | *1* | *1* | *2* |
| | *(Range)* | *(0-16)* | *(0-14)* | *(0-20)* | *(0-14)* | *(0-11)* |

*Follow-up of growth faltering*

In summary, there was continuing wide variation between health centres in the recording of follow-up actions for children with a record of growth faltering. For health centres that completed three or more audit cycles, there appears to be some improvement and a reduction in variation in recording follow-up actions.

***Figure 2.6  Mean percent of children with growth faltering who had documented evidence of 1) clinical assessment 2) follow-up weight check, 3) nutrition advice and 4) an action plan, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited who had documented evidence of growth faltering).***

**AUDIT YEAR**

**A1)**



**AUDIT CYCLE**

**B1)**

**AUDIT YEAR**

**A2)**
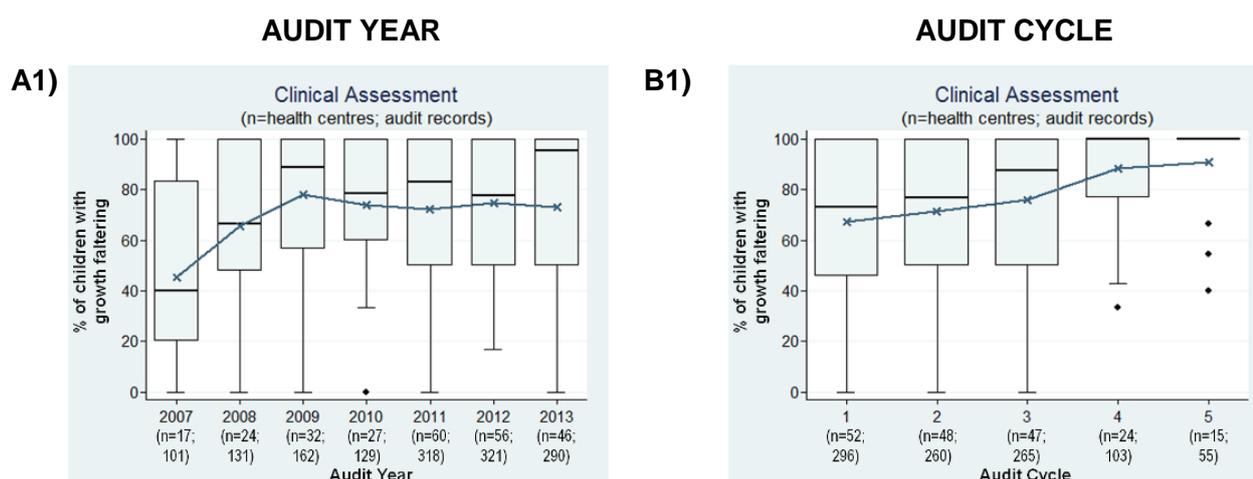


**AUDIT CYCLE**
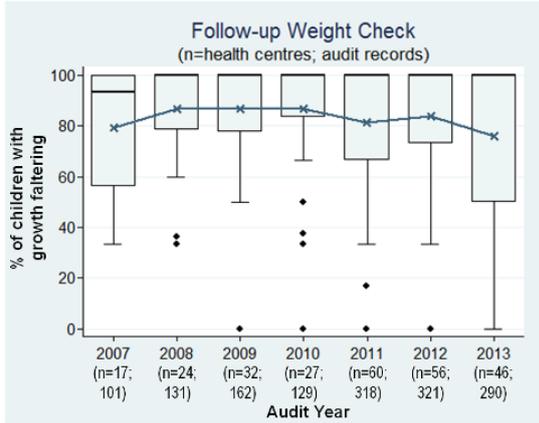
**B2)**
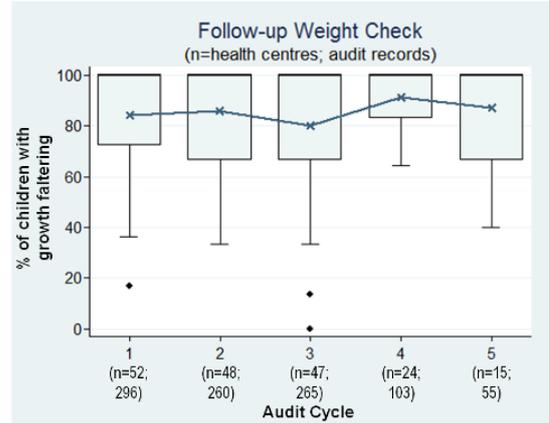


**A3)**
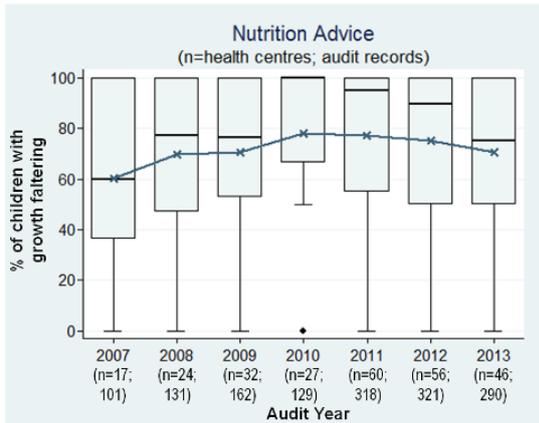


**B3)**
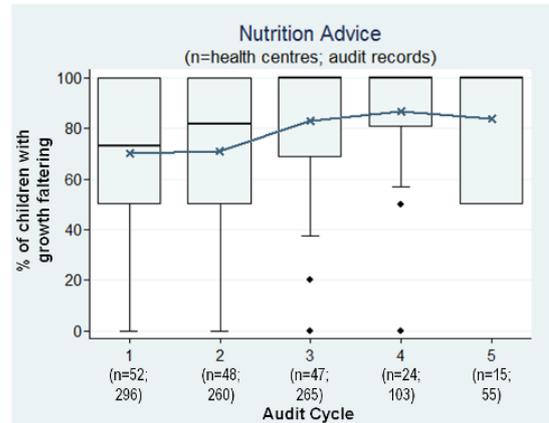


**A4)**
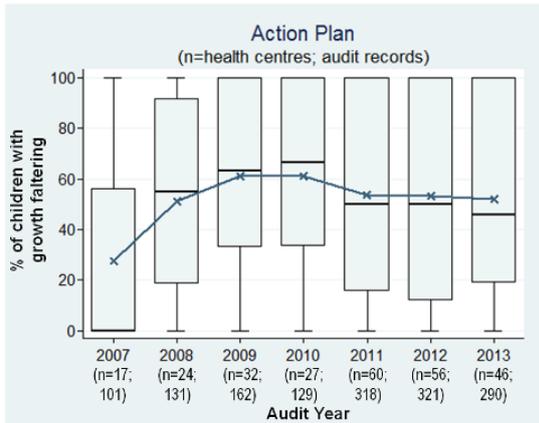


**B4)**
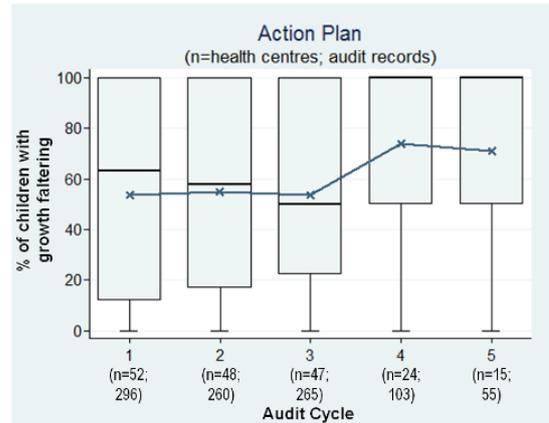
*Recording of ear examinations and chronic ear infections*

In summary, there was an improving trend in recording ear examinations, as well as a reduction in variation between health centres over years and across successive audit cycles. There is also some reduction in variation between health centres in recording chronic ear infections over years, and a more clear reduction in variation over successive cycles for health centres that completed three or more audit cycles.

**Figure 2.7** *Mean percent of children attending within the previous 12 months who 1) had an ear exam and 2) had evidence of chronic ear infection, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with attendance in previous 12 months).*
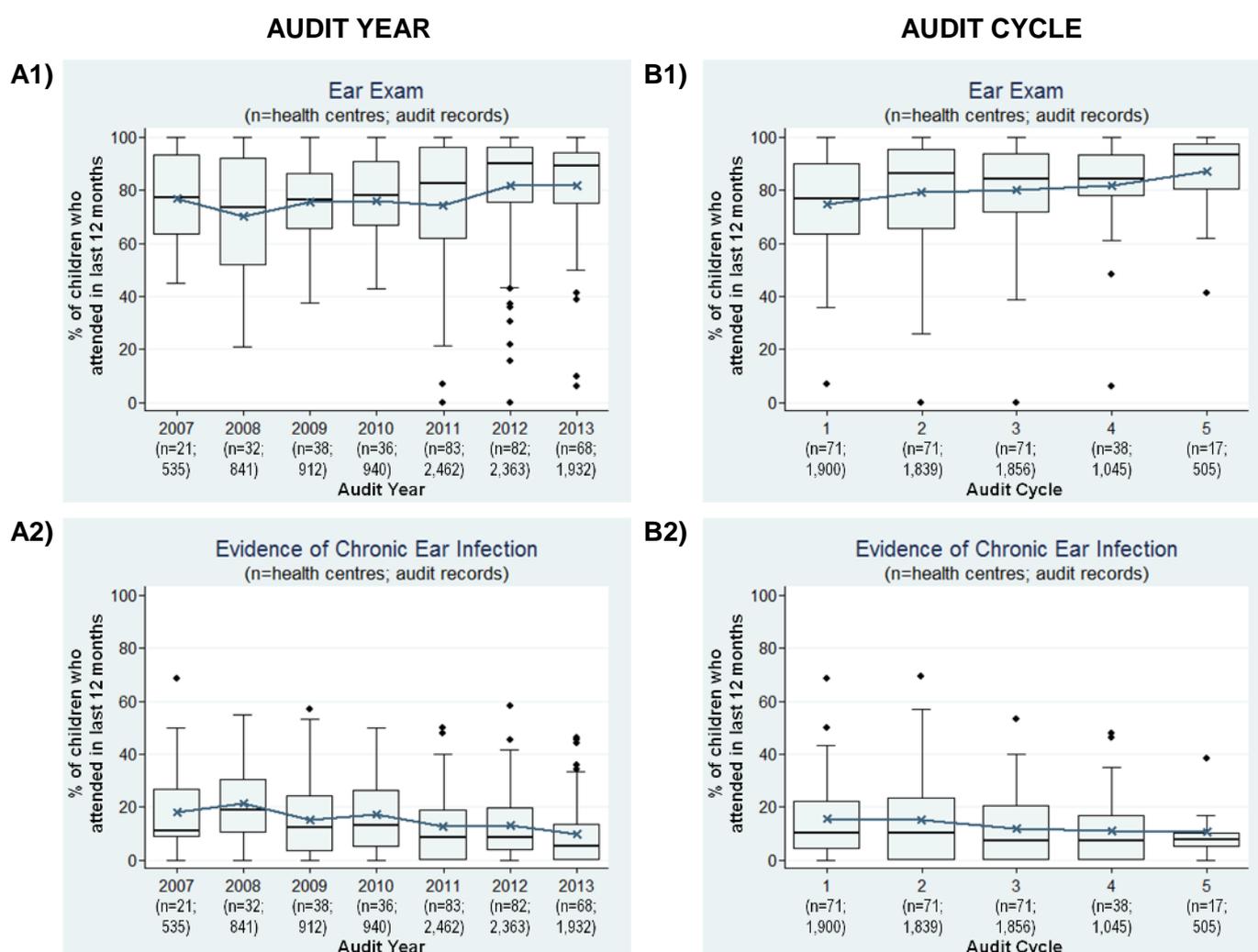
**Figure 2.8** *Mean percent of children with an ear examination who had documented evidence of chronic ear infection, by A) audit year and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with an ear examination).*

| AUDIT YEAR | AUDIT CYCLE |
|---|---|
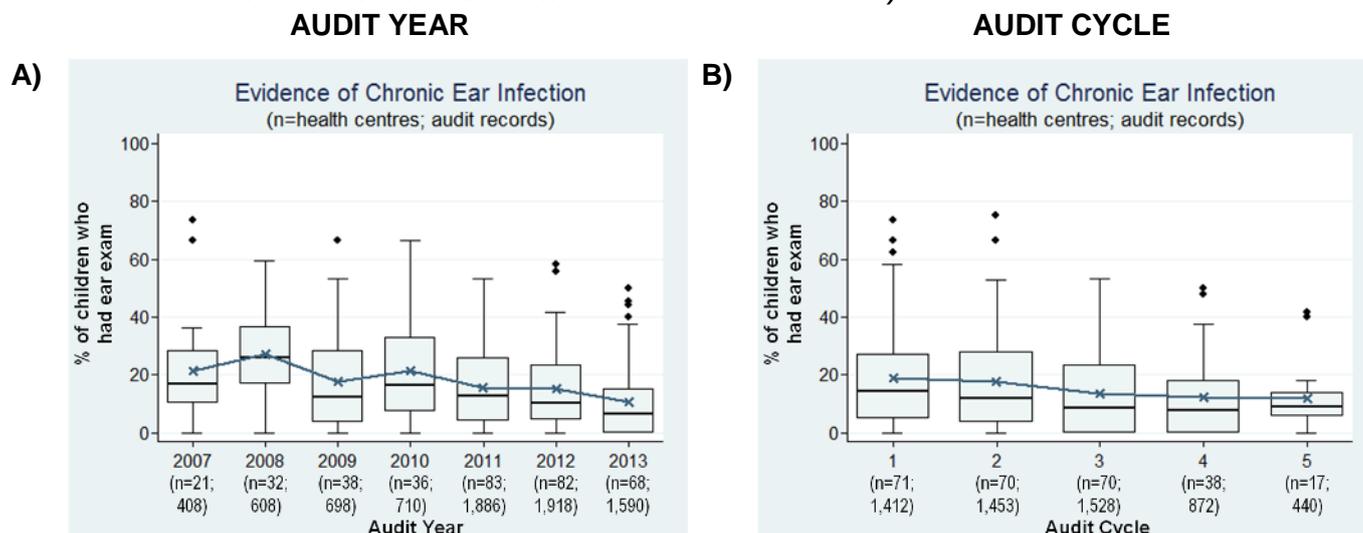


**Table 2.6** *Mean, median and range of the number of children's records audited, with an ear examination and documented evidence of chronic ear infection, by audit year across all health centres.*

| Audit Year | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| Number of Health Centres | | 21 | 32 | 38 | 36 | 83 | 82 | 68 |
| **Number of audit records** | **Mean** | **26.9** | **28.7** | **25.7** | **27.1** | **30.7** | **29.9** | **29.0** |
| | *Median* | *30* | *30* | *29.5* | *28* | *30* | *26* | *22.5* |
| | (Range) | (15-30) | (12-53) | (8-30) | (7-60) | (6-90) | (6-94) | (5-98) |
| **Ear Exam Documented** | **Mean** | 19.4 | **19.0** | 18.4 | 19.7 | 22.7 | 23.4 | 23.4 |
| | *Median* | *19* | *17* | *18* | *18.5* | *21* | *22* | *16.5* |
| | (Range) | (11-28) | (5-47) | (6-30) | (3-41) | (0-89) | (0-82) | (1-88) |
| **Evidence of Chronic Ear Infection** | **Mean** | **4.3** | **5.9** | **3.3** | **3.8** | **3.7** | **3.5** | **2.8** |
| | *Median* | *3* | *4.5* | *2* | *3* | *2* | *2* | *1* |
| | (Range) | (0-14) | (0-28) | (0-16) | (0-11) | (0-18) | (0-18) | (0-16) |

***Table 2.7 Mean, median and range of the number of children's records audited, with an ear exam and documented evidence of chronic ear infection, by audit cycle across health centres that have at least 3 years of audit data.***

| Audit Cycle | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Number of Health Centres | | 71 | 71 | 71 | 38 | 17 |
| **Number of audit records** | **Mean** | **27.7** | **27.1** | **27.1** | **28.6** | **30.2** |
| | *Median* | *29* | *27* | *27* | *26* | *30* |
| | (Range) | (8-90) | (8-72) | (6-98) | (5-61) | (10-63) |
| **Ear Exam Documented** | **Mean** | **19.9** | **20.5** | **21.5** | **22.9** | **25.9** |
| | *Median* | *20* | *20* | *18* | *22* | *25* |
| | (Range) | (4-89) | (0-48) | (0-88) | (1-51) | (7-63) |
| **Evidence of Chronic Ear Infection** | **Mean** | **3.6** | **3.6** | **3.2** | **3.4** | **2.9** |
| | *Median* | *2* | *2* | *2* | *2* | *2* |
| | (Range) | (0-14) | (0-15) | (0-16) | (0-18) | (0-10) |

*Follow-up of chronic ear infections*

In summary, over years, there was continuing wide variation between health centres in the recording of follow-up actions for children with recorded evidence of ear infection, although there is some evidence of improvement overall. There appears to be improvement associated with completion of three or more audit cycles in recording of two out of four key follow-up actions (antibiotic prescription and follow-up ear examination) as well as a reduction in variation between health centres in recording of these two follow-up actions.

**Figure 2.9** *Mean percent of children with chronic ear infection who had documented evidence of 1) antibiotics prescription; 2) follow-up ear exam; 3) ear care advice and 4) an action plan, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with documented evidence of chronic ear infection).*
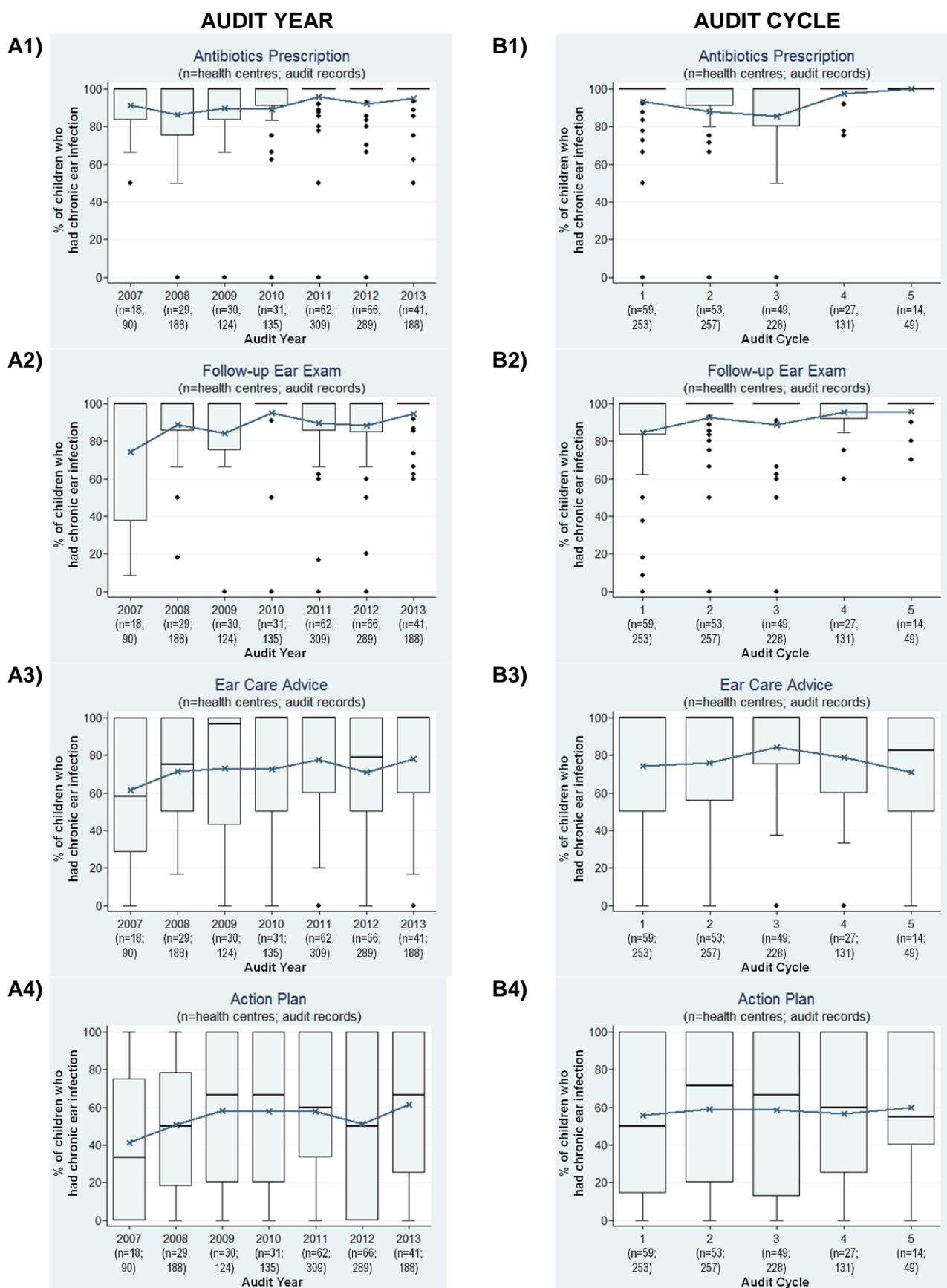
*Haemoglobin checks and evidence of anaemia*

In summary, there is no clear indication that there has been a change in the patterns of routine checking for anaemia, or in recording evidence of anaemia, across years or audit cycles.

***Figure 2.10 Mean percent of children attending within the previous 12 months who 1) had a haemoglobin check and 2) had evidence of anaemia, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with attendance in previous 12 months).***
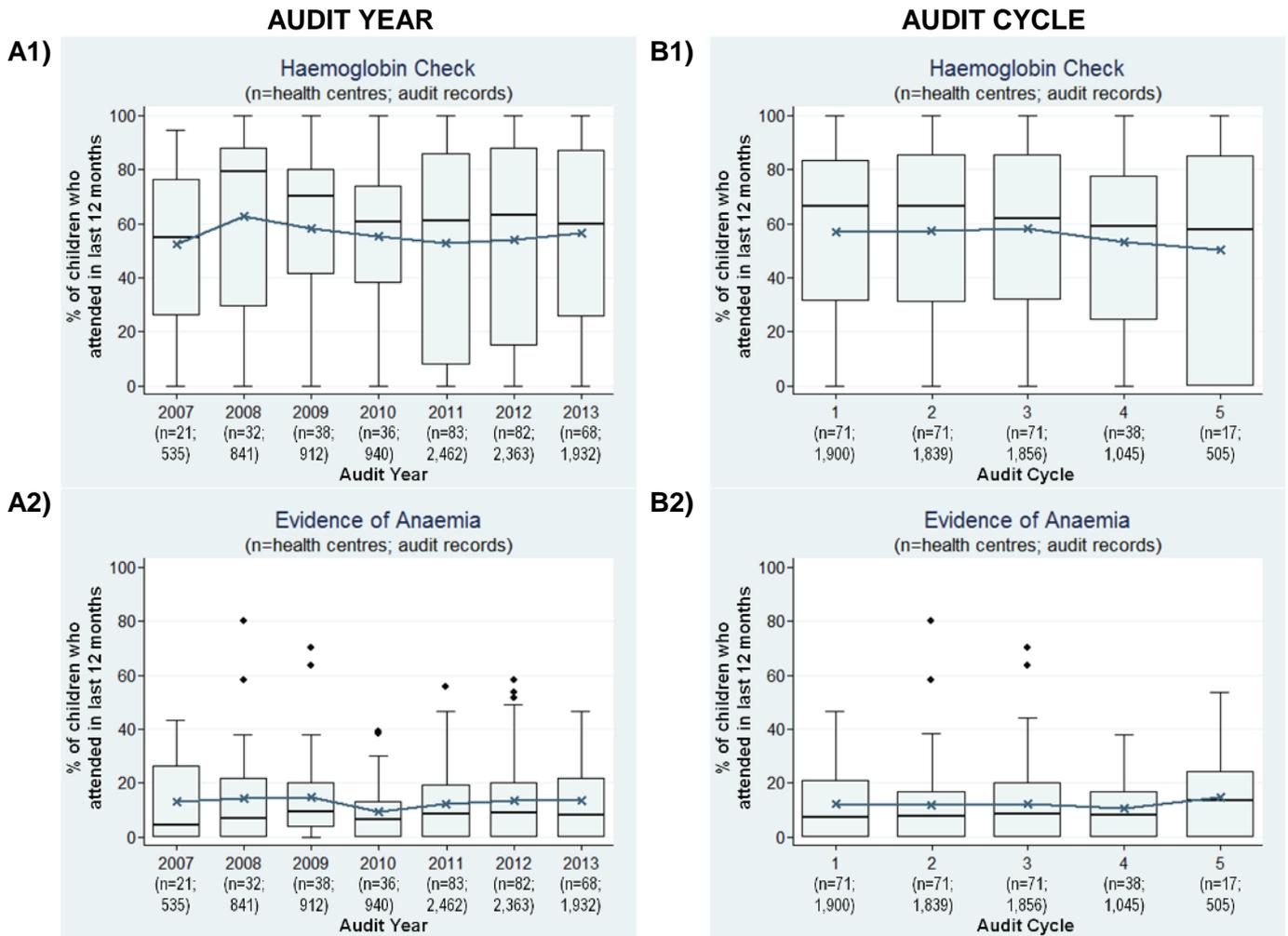
**Figure 2.11** *Mean percent of children with a haemoglobin check who had documented evidence of anaemia, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with a haemoglobin check).*

**AUDIT YEAR**     **AUDIT CYCLE**

A)

B)
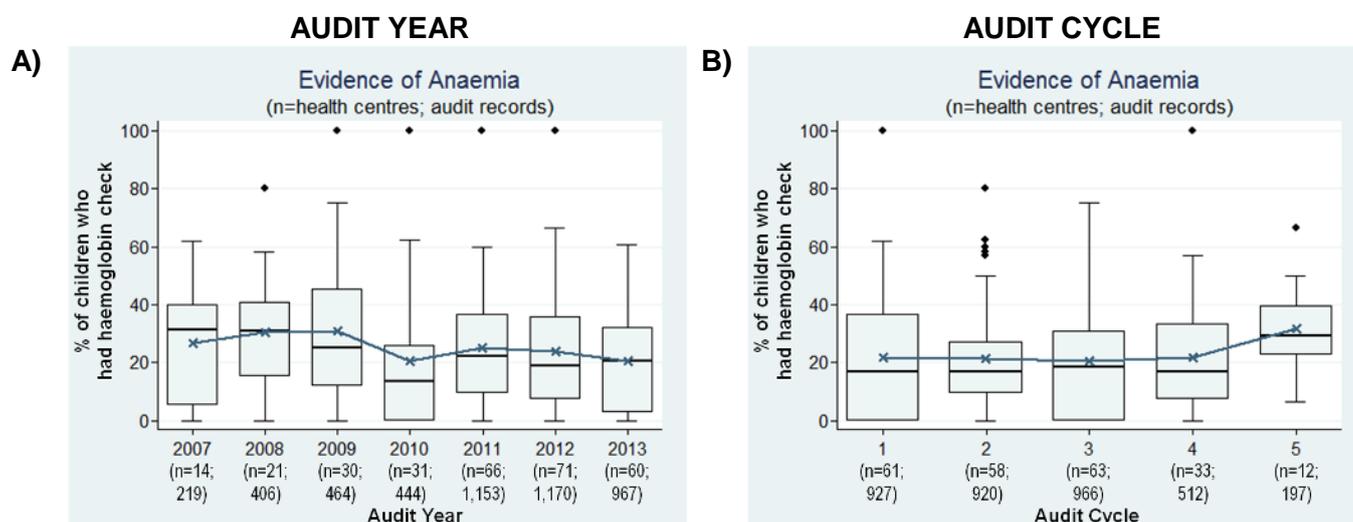


**Table 2.8** *Mean, median and range of the number of children's records audited, with a haemoglobin check and documented evidence of anaemia, by audit year across all health centres.*

| Audit Year | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| Number of Health Centres | | 21 | 32 | 38 | 36 | 83 | 82 | 68 |
| **Number of audit records** | **Mean** | **26.9** | **28.7** | **25.7** | **27.1** | **30.7** | **29.9** | **29.0** |
| | *Median* | *30* | *30* | *29.5* | *28* | *30* | *26* | *22.5* |
| | (Range) | (15-30) | (12-53) | (8-30) | (7-60) | (6-90) | (6-94) | (5-98) |
| **Haemoglobin check documented** | **Mean** | **10.4** | **12.7** | **12.2** | **12.3** | **13.9** | **14.3** | **14.2** |
| | *Median* | *12* | *13.5* | *13.5* | *13.5* | *13* | *14.5* | *12* |
| | (Range) | (0-27) | (0-47) | (0-28) | (0-27) | (0-43) | (0-55) | (0-70) |
| **Evidence of Anaemia** | **Mean** | **3.0** | **3.8** | **3.4** | **2.4** | **3.3** | **3.9** | **3.6** |
| | *Median* | *1* | *2* | *2* | *1* | *2* | *2* | *2* |
| | (Range) | (0-13) | (0-17) | (0-21) | (0-10) | (0-16) | (0-24) | (0-24) |

**Table 2.9** *Mean, median and range of the number of children's records audited, with a haemoglobin check and documented evidence of anaemia, by audit cycle across health centres that have at least 3 years of audit data.*

| Audit Cycle | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Number of Health Centres | | 71 | 71 | 71 | 38 | 17 |
| **Number of audit records** | **Mean** | **27.7** | **27.1** | **27.1** | **28.6** | **30.2** |
| | *Median* | *29* | *27* | *27* | *26* | *30* |
| | (Range) | (8-90) | (8-72) | (6-98) | (5-61) | (10-63) |
| **Haemoglobin check documented** | **Mean** | **13.1** | **13.0** | **13.6** | **13.5** | **11.6** |
| | *Median* | *14* | *14* | *13* | *14* | *15* |
| | (Range) | (0-30) | (0-44) | (0-44) | (0-43) | (0-24) |
| **Evidence of Anaemia** | **Mean** | **2.8** | **2.8** | **3.1** | **3.1** | **3.9** |
| | *Median* | *2* | *2* | *3* | *2* | *2* |
| | (Range) | (0-14) | (0-16) | (0-21) | (0-14) | (0-14) |

*Follow-up of anaemia*

In summary, there is continuing wide variation between health centres in the recording of follow-up actions for children with a record of evidence of anaemia. There is little indication in the available data of improvement associated with completion of three or more audit cycles, or of a reduction in variation between health centres in recording of follow-up actions.

**Figure 2.12** **Mean percent of children with anaemia who had documented evidence of 1) de-worming treatment; 2) a follow-up haemoglobin check; 3) iron prescription; and 4) nutrition advice by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with documented evidence of anaemia).**

      

**A4)**



**B4)**

(NB: Nutrition advice not introduced into child health audit tool in 2011, therefore data across three years not yet available.)
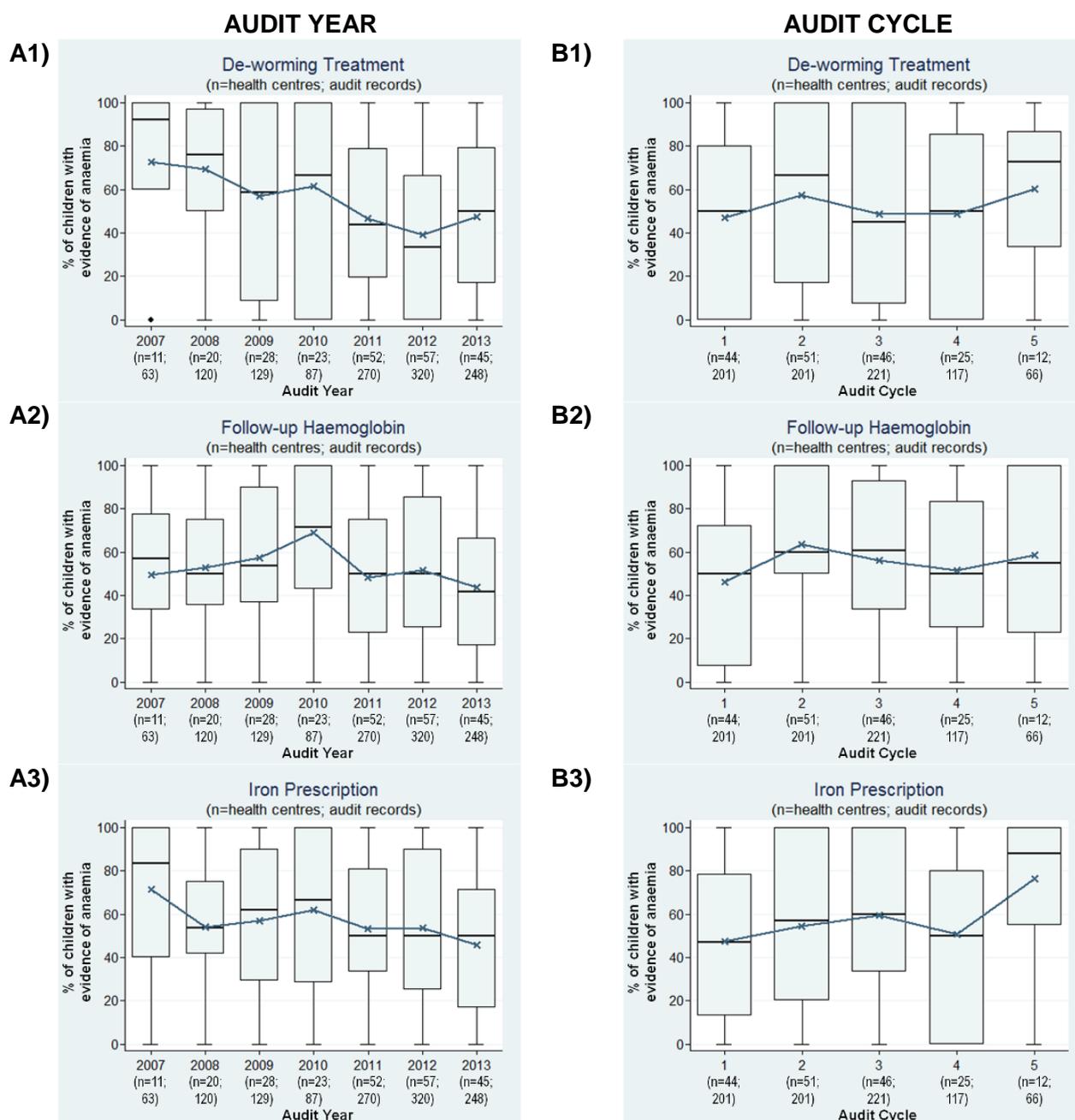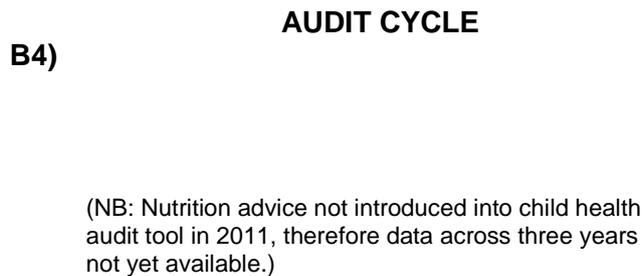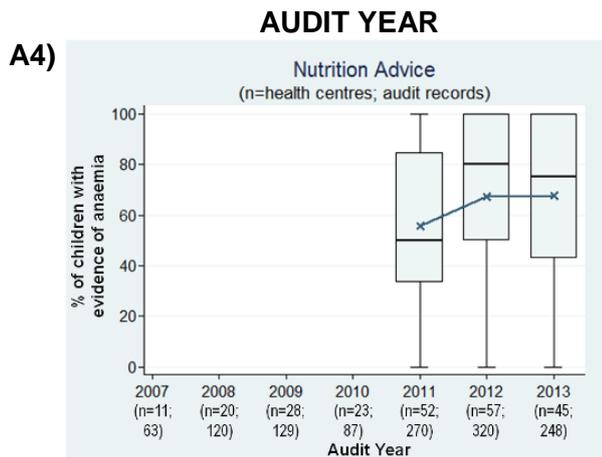
## Developmental milestones and evidence of developmental delay

In summary, there is continuing wide variation between health centres in recording assessment of developmental milestones among participating health centres over 2007 to 2013, with some evidence of an improvement between 2007 and 2010. For health centres that had completed at least three audit cycles, there was improvement in recording of assessments and in variation between health centres over successive cycles. There is some evidence of increased consistency or standardisation of recording evidence of developmental delay over successive audit cycles.

**Figure 2.13** *Mean percent of children <4 years of age attending within the previous 12 months who had a developmental milestones check, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with attendance in previous 12 months).*

**AUDIT YEAR**        **AUDIT CYCLE**

**A)**



**B)**
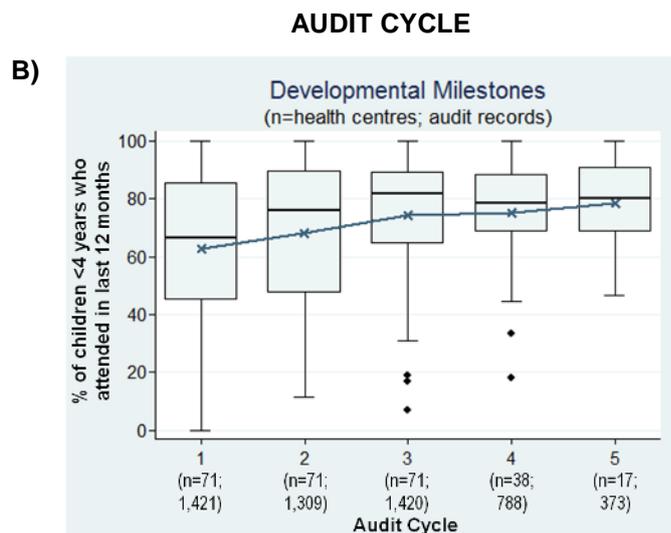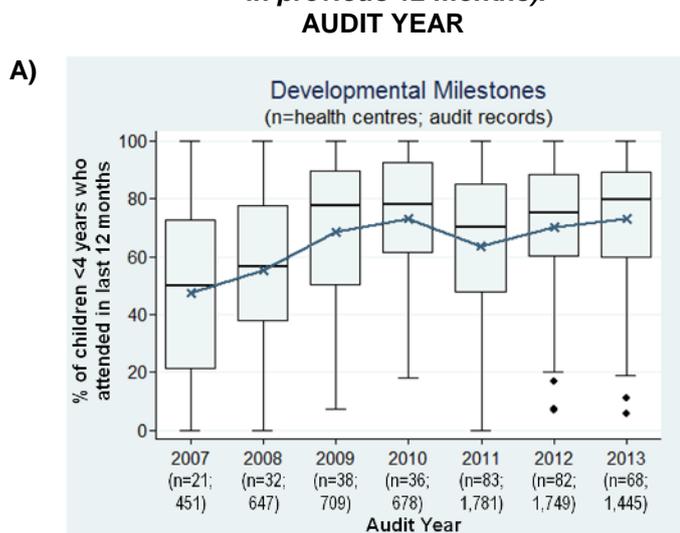
**Figure 2.14** *Mean percent of children attending within the previous 12 months who had evidence of developmental delay, by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with attendance in previous 12 months).*

**AUDIT YEAR**

A)

**AUDIT CYCLE**

B)
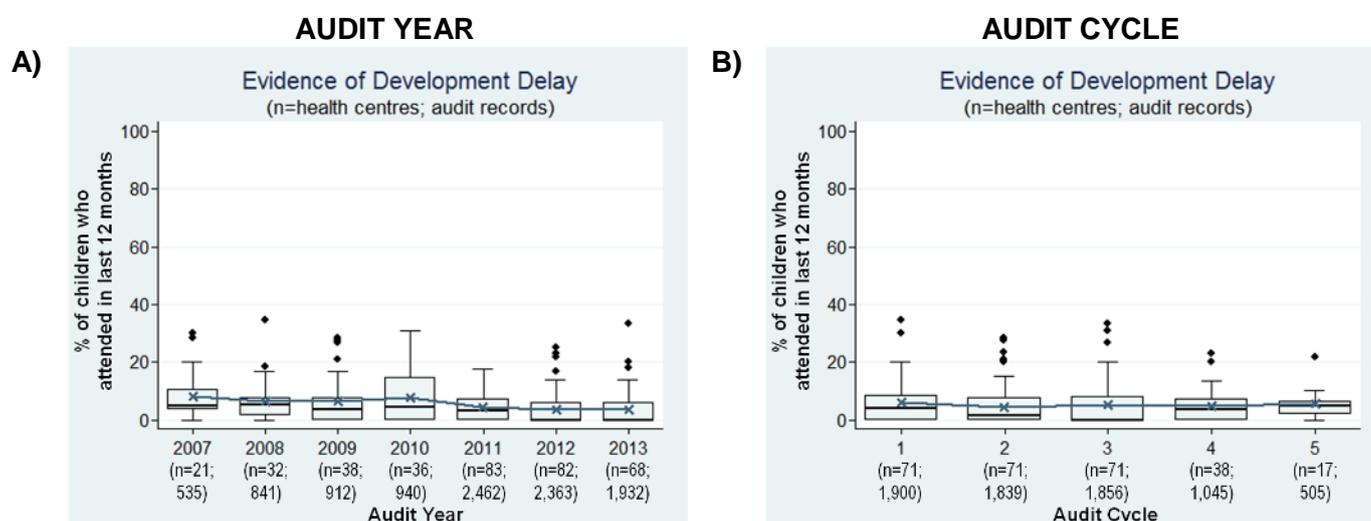


**Table 2.10** *Mean, median and range of the number of children records audited, with documented evidence of developmental delay, by audit year across all health*

| Audit Year | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|
| Number of Health Centres | | 21 | 32 | 38 | 36 | 83 | 82 | 68 |
| **Number of audit records** | **Mean** | **26.9** | **28.7** | **25.7** | **27.1** | **30.7** | **29.9** | **29.0** |
| | *Median* | *30* | *30* | *29.5* | *28* | *30* | *26* | *22.5* |
| | (Range) | (15-30) | (12-53) | (8-30) | (7-60) | (6-90) | (6-94) | (5-98) |
| **Evidence of Developmental Delay** | **Mean** | **2.1** | **1.7** | **1.6** | **2.1** | **1.4** | **1.1** | **1.0** |
| | *Median* | *1* | *1* | *1* | *1* | *1* | *0* | *0* |
| | (Range) | (0-9) | (0-9) | (0-8) | (0-8) | (0-10) | (0-6) | (0-13) |

*centres.*

**Table 2.11** *Mean, median and range of the number of children records audited, with documented evidence of developmental delay, by audit cycle across health centres that have at least 3 years of audit data.*

| Audit Cycle | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Number of Health Centres | | 71 | 71 | 71 | 38 | 17 |
| **Number of audit records** | **Mean** | **27.7** | **27.1** | **27.1** | **28.6** | **30.2** |
| | *Median* | *29* | *27* | *27* | *26* | *30* |
| | (Range) | (8-90) | (8-72) | (6-98) | (5-61) | (10-63) |
| **Evidence of Developmental Delay** | **Mean** | **1.7** | **1.3** | **1.5** | **1.3** | **1.5** |
| | *Median* | *1* | *1* | *0* | *1* | *1* |
| | (Range) | (0-10) | (0-8) | (0-13) | (0-6) | (0-5) |

*Follow-up of developmental delay*

In summary, there is continuing wide variation between health centres in the recording of follow-up actions for children with a record of evidence of developmental delay over years, with some indication of improvement in recent years and for health centres that had completed three or more audit cycles.

**Figure 2.15** **Mean percent of children with developmental delay who had documented evidence of 1) referral, and 2) follow-up assessment by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with documented evidence of developmental delay).**
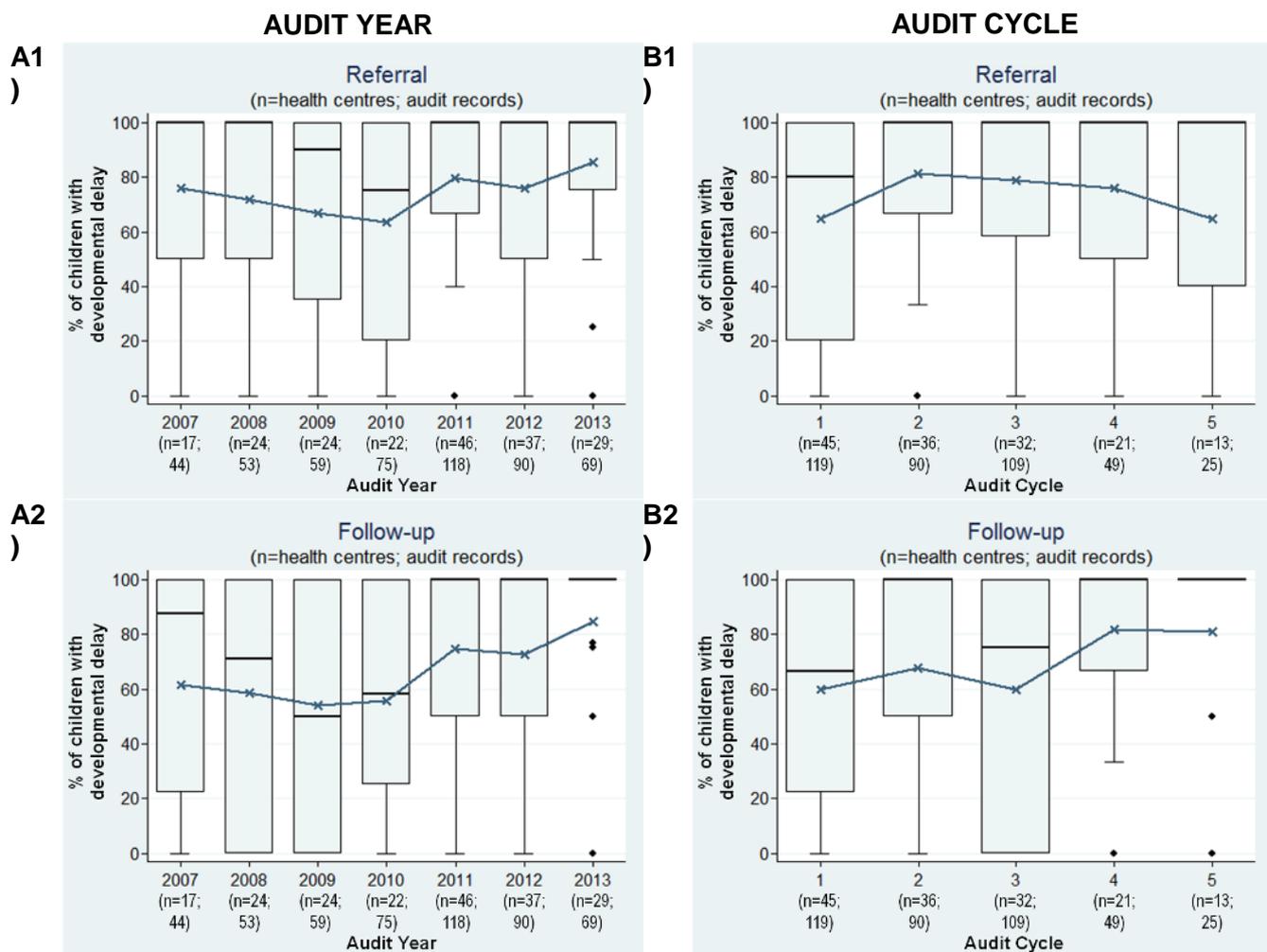
## 2.6.    Advice and brief interventions

In summary, there has been improvement over audit years and over successive audit cycles in recording discussion of nutrition, physical and mental stimulation, passive smoking, infection prevention and housing condition. There has been a decrease over successive cycles in variation between health centres in recording discussion of nutrition, with notable improvement in health centres at the lower end of the range. There has been continuing wide variation between health centres for other indicators across years and audit cycles.

*Figure 2.16* *Percentage of children attending within the past 12 months who had a record of discussion on 1) nutrition, 2) physical and mental stimulation, 3) passive smoking, 4) infection prevention, and 5) housing condition by A) audit year for all health centres and B) audit cycle for health centres that have at least 3 years of audit data (n=number of health centres; number of children's records audited with attendance in previous 12 months).*



**AUDIT YEAR**

A1) Discussion of Nutrition (n=health centres; audit records)

A2) Discussion of Physical & Mental Stimulation (n=health centres; audit records)

**AUDIT CYCLE**

B1) Discussion of Nutrition (n=health centres; audit records)

B2) Discussion of Physical & Mental Stimulation (n=health centres; audit records)

**AUDIT YEAR**

**AUDIT CYCLE**

**A3)**



Discussion of Passive Smoking
(n=health centres; audit records)

**B3)**



Discussion of Passive Smoking
(n=health centres; audit records)

**A4)**



Discussion of Infection Prevention
(n=health centres; audit records)

**B4)**



Discussion of Infection Prevention
(n=health centres; audit records)

**A5)**



Discussion of Housing Condition
(n=health centres; audit records)

**B5)**



Discussion of Housing Condition
(n=health centres; audit records)

## 2.7.     Health centre systems

In summary, there has been continued wide variation between all health centres over audit years in scores for the overall systems assessment, links with community and regional health planning.  For health centres that participated in three or more audit cycles, the scores for overall systems assessment, links with community and regional health planning show improvement and decreasing variation between health centres over successive cycles, with an increase in scores for health centres at the lower end of the range.

**Figure 2.17** *Overall system assessment score\*, by A) year for all health centres and B) cycle for health centres that have at least 3 years of systems assessment data (n=number of health centres that conducted a systems assessment).*
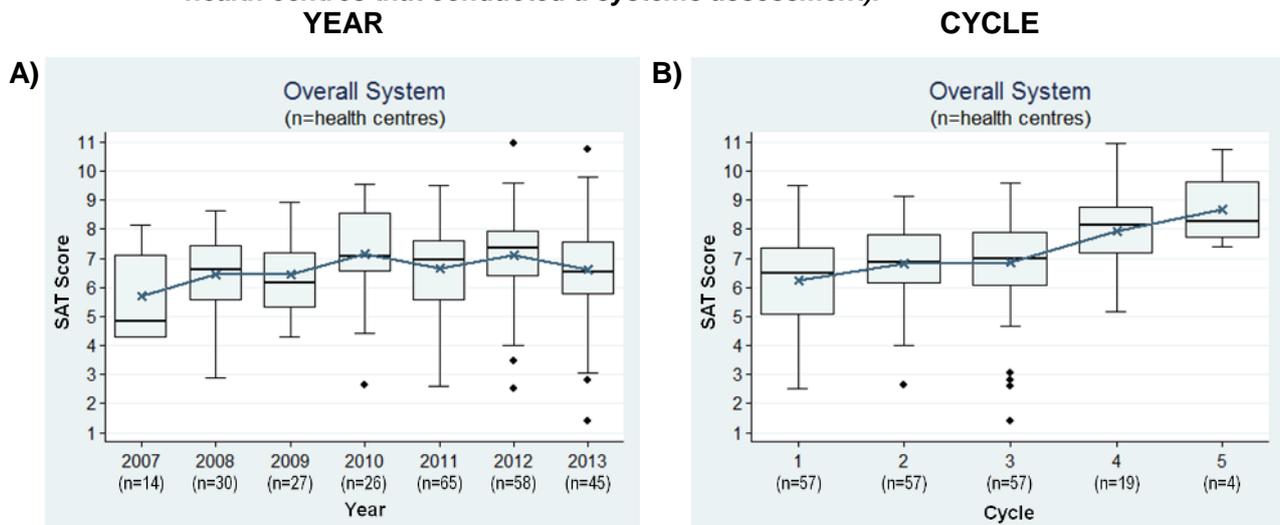


\*Overall score is the average of each of the five domain scores that make up the total systems assessment (ie, delivery system design, information systems and decision support, self-management support, links with the community, other health services and other resources, and organisational influence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

**Figure 2.18** *'Community Links' domain score, by A) year for all health centres and B) cycle for health centres that have at least 3 years of systems assessment data (n=number of health centres that conducted a systems assessment).*
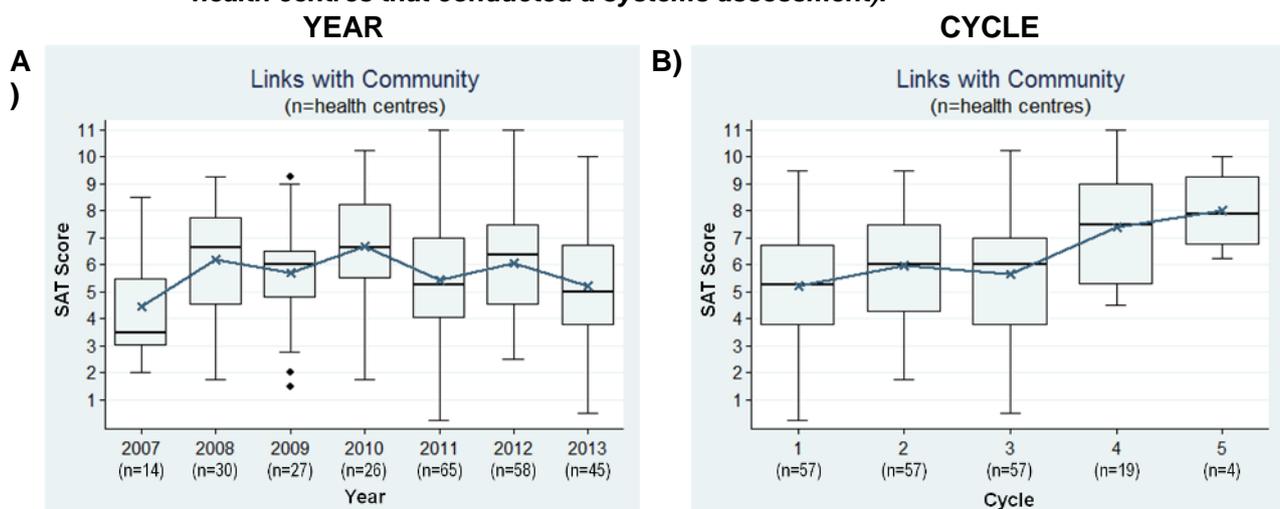
**Figure 2.19** *'Regional Planning' subcomponent score, by A) year for all health centres and B) cycle for health centres that have at least 3 years of systems assessment data (n=number of health centres that conducted a systems assessment).*
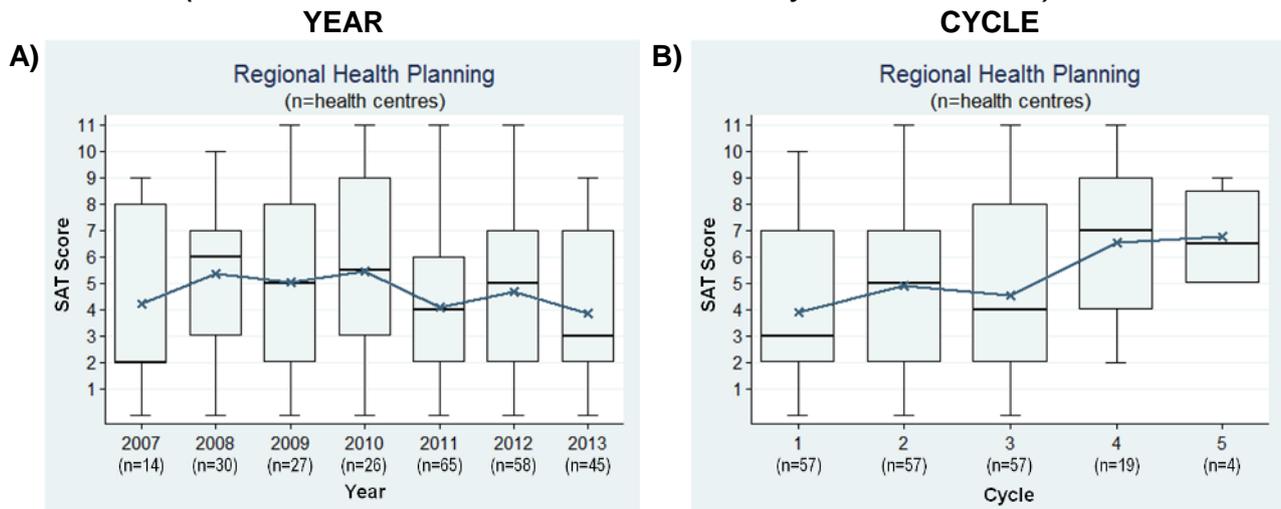
***Table 2.12***        ***Summary of trends in areas of priority evidence-practice gaps***

| | **Areas of priority evidence-practice gaps** | | | | | | | | | | | | | |
| | | *Immunisations* | | | *Clinical examinations* | | | | *Follow-up* | | | | | |
| | *Overall child health* | *Chart in records* | *Hep B birth* | *MMR 4yrs* | *Weight* | *Ear* | *Haemo-globin* | *Develop-mental mile-stones* | *Growth faltering* | *Chronic ear infection* | *Anaemia* | *Develop-mental delay* | *Advice and brief interventions* | *Health centre systems* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trends by audit year | □ | □ | ~ | □ | **?**□ | □ | ~ | **?**□ | **?**□ | □ | ~ | **?**□ | □ | ~ |
| Reduced variation over audit years – all health centres | ✘ | ✓ | ✘ | ✓ | ✘ | **?**✓ | ✘ | ✘ | ✘ | **?**✓ | ✘ | **?**✓ | **?**✓ | ✘ |
| Trends by audit cycle | □ | ~ | □ | □ | □ | □ | ~ | □ | □ | **?**□ | ~ | **?**□ | □ | □ |
| Reduced variation by audit cycle – health centres completed 3+ cycles | ✓ | ✓ | ✘ | **?**✓ | **?**✓ | ✓ | ✘ | ✓ | ✓ | **?**✓ | ✘ | **?**✓ | **?**✓ | ✓ |

Symbols:        □ increasing trend over time; **?**□ some but not consistent evidence of increasing trend over time; ~ no evidence of increasing trend over time
✓ reduced variation over successive years or successive audit cycles; **?**✓ some but not consistent evidence of reduced variation over time; ✘ no evidence of reduction in variation over time.