Use of developmental assessment questionnaires within 27 month child health reviews: insights from the first year of review delivery

Introduction

Child health reviews for children aged 27-30 months were introduced into the Scottish child health programme in April 2013. National guidance on the purpose, content, and delivery of the reviews was published by the Scottish Government in December 2012 in order to support a consistent approach to provision of effective reviews across Scotland (http://www.scotland.gov.uk/Publications/2012/12/1478).

The national guidance identified ‘promotion of strong early child development’ (p3) as one of two overarching priorities for 27 month reviews and included detailed guidance on the appropriate approach to assessing children’s development within the context of child health reviews. It recommended ‘systematic consideration of all children’s development as part of ongoing surveillance’ (p8). It noted that the National Screening Committee does not currently recommend screening for childhood developmental and behavioural problems (http://www.screening.nhs.uk/developmentbehaviour).

The guidance described developmental surveillance as comprising the following steps:

- Asking parents about any concerns they have regarding their child’s development (supported by use of the Parents’ Evaluation of Developmental Status (PEDS) questionnaire if desired)
- Asking parents about their child’s developmental abilities and attainment of relevant milestones (supported by use of the PEDS: Developmental Milestones (PEDS:DM) questionnaire if desired)
- Structured observation of the child within the context of the review to assess their developmental progress
- Then, if there are any uncertainties or concerns (from the parent or Health Visitor) about the child’s development, using an appropriate developmental assessment questionnaire to obtain objective information on the child’s developmental status and to help inform decisions about further assessment and support needs.

The validated questionnaires that were recommended in the guidance as suitable for use in 27 month old children were:

- Ages and Stages Questionnaire 3 (ASQ 3 – all developmental domains)
- Schedule of Growing Skills II (SOGS II – all developmental domains)
- Strengths and Difficulties Questionnaire (SDQ – social/emotional domains)
- ASQ: Social and Emotional (ASQ:SE – social/emotional domains)
• Sure Start Language Measure (SSLM – speech and language domain)
• Modified Checklist for Autism in Toddlers (M-CHAT – autism risk)
• Eyberg Child Behaviour Inventory (Eyberg CBI – behavioural difficulties)

From discussions that took place when the 27 month guidance was being produced, it was clear that Boards were intending to interpret the guidance in different ways and adopt different approaches to incorporating the use of the various recommended developmental assessment questionnaires within 27 month reviews. Some Boards were interested in offering questionnaires to all children/parents invited for reviews rather than just administering them if/when a problem was suspected. Boards also differed in the questionnaires they intended to select from the national list for use locally: some preferred the ASQ as a multi-domain questionnaire whereas others had a long history of using SOGS, others preferred to use more focused questionnaires to identify problems in ‘indicator’ domains rather than using multi-domain tools.

Despite this anticipated variation in approaches to delivery of 27 month reviews, no formal, national level evaluation of the reviews was planned. The guidance recognised this and recommended that, in the absence of a formal evaluation, at least active consideration of the routine data generated through review delivery should be undertaken, viz. ‘it is likely that, at least in the shorter term, Boards will take different approaches to the use of the recommended tools…Over time the data generated [from 27 month review records] will allow exploration of any associations between different approaches to developmental assessment, identification of developmental concerns, interventions, and ultimately children’s outcomes and hence inform further refinement of policy and guidance on this issue.’ (p 10-11).

Since April 2013, it has become apparent that the anticipated variation in use of developmental assessment questionnaires within 27 month reviews has occurred. Whether the different approaches being adopted across Scotland are influencing the detection of developmental problems and their outcomes is the focus of lively debate. Data are now available on the 27 month reviews provided over the first year of their delivery (i.e. April 2013 to March 2014). This paper therefore aims to use these data to assess how different Boards have used developmental assessment questionnaires within 27 month reviews over this period and whether this has influenced the quality of information recorded on children’s development; the identification of concerns about children’s development; and/or the actions taken to further assess and support children’s development.

This paper is initially (November 2014) being circulated as management information to territorial NHS Board Directors of Public Health and Directors of Nursing and to relevant policy colleagues within the Scottish Government as previously agreed. NHS National Services Scotland, Information Services Division
(ISD) is planning to release the first formal publication on 27 month review delivery by end 2014. The publication will give high level information on review coverage and identification of developmental concerns over 2013/14. Once that publication is released, this supplementary paper will be made publicly available on the child health area of ISD’s website (http://www.isdscotland.org/Health-Topics/Child-Health/). It is hoped that this paper will be used to inform national and local discussions on the delivery of child health reviews in Scotland. Anyone wanting to discuss this paper further should contact rachelwood@nhs.net or NSS.isdchildhealth@nhs.net.
Methods

All children in Scotland are registered on the linked national child health information systems. When a child is approaching 27 months (or slightly older in some Boards), the system that manages child health reviews for pre-school children (Child Health Surveillance Programme – Preschool, CHSP-PS) issues an invitation for their 27 month review. Once the child’s Health Visitor has completed the review, he/she records the key findings on the relevant CHSP-PS form and the details are subsequently entered into the electronic system by administrative staff. Quarterly extracts of the information held within CHSP-PS are passed to ISD for statistical analysis purposes.

This analysis is based on the May 2014 CHSP-PS extract and includes information on all completed 27 month child health reviews conducted in the year April 2013 to March 2014 on children aged 24-35 months inclusive that were recorded on the system at that point. Note that figures quoted in this paper differ slightly to those published in the official statistics publication. This is because the publication is based on a more recent extract.

Health Visitors are asked to record two key items relating to children’s development on the 27 month review CHSP-PS form (https://isdscotland.scot.nhs.uk/Health-Topics/Child-Health/Child-Health-Programme/27-30-month-form.pdf). Firstly, their overall assessment of children’s development by domain and, secondly, whether they used any developmental assessment questionnaires as part of the assessment process.

The developmental domains listed on the form are:
- Social
- Emotional
- Behavioural
- Attention
- Speech, language and communication
- Gross motor
- Fine motor
- Vision
- Hearing

The response options for each domain are:
- No concerns
- Concern newly suspected (i.e. as a result of assessment undertaken during the 27 month review)
- Concern/disorder previously identified (i.e. known prior to the review)
• Assessment incomplete
Health Visitors are also asked to record each (up to four) developmental assessment questionnaire that they used as part of a child’s 27 month review. Response options correspond to the validated questionnaires appropriate to this age group that were recommended in the national guidance on the 27 month review, i.e.
  • PEDS
  • PEDS:DM
  • ASQ 3
  • SOGS II
  • SDQ
  • ASQ:SE
  • SSLM
  • M-CHAT
  • Eyberg CBI
  • Other (i.e. another validated questionnaire not on the recommended list)
  • None

Firstly, the proportion of reviews conducted in each Board that recorded use of each of the available questionnaires was examined to give an understanding of the pattern of questionnaire use in each Board. A number of Boards recorded ‘other’ questionnaire use in a substantial proportion of review records and it was not clear what this meant in practice. A request for clarification was therefore sent in March 2014 to the Nurse Director of the 10 Boards that recorded ‘other’ questionnaire use in at least 5% of reviews conducted in the quarter July to September 2013. The information held on CHSP-PS and the responses from the Boards were used to classify the pattern of questionnaire use in each Board.

Then, the proportion of 27 month reviews with (a) meaningful data relating to children’s development (no concerns, new concern, or previous concern) and (b) developmental concerns identified was examined for Boards with different patterns of questionnaire use. Developmental domains were examined individually and as composites of:
  • Social, emotional, behavioural, and attention domains
  • Speech, language and communication domain
  • Gross and fine motor domains
  • Vision and hearing domains, and
  • All domains
Analysis of developmental concerns identified was conducted looking at:

- New concerns only (as these are most likely to be influenced by the approach to developmental assessment used within the 27 month review) and both new and previous concerns
- All reviews and only those containing complete developmental outcome information (i.e. no concern, new concern, or previous concern recorded for all domains)
- All children and only those living in the most deprived areas (Scottish Index of Multiple Deprivation (SIMD) 2012 version, Scotland level, deprivation quintile 1)

The coverage of 27 month reviews in all children and those living in the most deprived areas was estimated to assess the possible extent of any relationship between deprivation and the likelihood of children receiving their review, as significant inequality in coverage could bias findings relating to identification of developmental concerns by deprivation. For this analysis, coverage was estimated by dividing the total number of reviews provided (or those provided to children living in quintile 1) by the National Records of Scotland 2012 mid year population estimate of 2 year olds (or the estimate of 2 year olds living in quintile 1). Note this is a different approach to that usually used by ISD and should only be taken as giving a broad indication of coverage levels.

The co-occurrence of concerns about multiple developmental domains was examined to assess the proportion of concerns that reflect either single domain/isolated issues or more complex/multi-domain issues.

Finally, the proportion of reviews for which an intended future action was recorded was examined. Health Visitors are asked to record future actions relating to the following areas/services on 27 month review CHSP-PS forms:

- Support from the child’s General Practitioner
- Parenting support
- Audiology
- Speech and language therapy
- Community Paediatrics
- Child and Adolescent Mental Health Services
- Childsmile (national dental health promotion programme)
- Smoking cessation
- Child healthy weight
- Early education
- Financial advice services
- Social work
- Physiotherapy or Occupational therapy
- Other

Any of the following action types can be recorded against any of the services:
- Provide - the Health Visitor him/herself will provide the service (only relevant for some services)
- Signpost to – the HV will provide the family with information on relevant local services and how to access them
- Discuss with – the HV will formally discuss the child/family with the specified service to inform future assessment/support
- Request assistance from – the HV will refer the child/family to the specified service
- Refused – the HV offered one of the above actions but the family refused

Any future action was defined as any of the action types (including refused) being recorded against any of the service types (including other).

Throughout the report, any results based on a numerator of <3 and/or a denominator of <100 have been suppressed both to protect patient confidentiality and to guard against over-interpretation of small numbers and associated unstable rates.
Findings

How have different Boards used developmental assessment questionnaires within 27 month reviews?

Table 1 summarises the use of developmental assessment questionnaires within 27 month reviews over 2013/14 by Board. It is clear that different Boards adopted different approaches to incorporating the use of developmental assessment questionnaires over the first year of 27 month review delivery.

- Three Boards (Ayrshire & Arran, Fife, and Lothian) used both a multi-domain questionnaire (ASQ 3) and a questionnaire focused on social/emotional development (ASQ:SE) on (almost) all children.
- Four Boards used just a multi-domain questionnaire on all children, either the ASQ (Tayside) or SOGS II (Borders, Dumfries & Galloway, Lanarkshire).
- Two Boards (Greater Glasgow & Clyde and Western Isles) used questionnaires that specifically assess social/emotional development (SDQ) and speech and language development (SSLM) on all children, and have not used multi-domain questionnaires.
- Three Boards (Forth Valley, Grampian, and Highland) have made more selective use of multi-domain and social/emotional questionnaires.
- The remaining two Boards (Orkney and Shetland) made minimal use of any validated questionnaires during 2013/14.
<table>
<thead>
<tr>
<th>Board (number of 27 reviews delivered in 2013/14)</th>
<th>Multi-domain questionnaire</th>
<th>Questionnaire focused on social/emotional domains</th>
<th>Questionnaire focused on speech and language domain</th>
<th>Other comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;A (2,971)</td>
<td>ASQ 3 - universal</td>
<td>ASQ:SE - universal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Borders (866)</td>
<td>SOGS II - universal</td>
<td>Minimal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>D&amp;G (1,241)</td>
<td>SOGS II - universal</td>
<td>Minimal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Fife (3,247)</td>
<td>ASQ 3 - universal</td>
<td>ASQ:SE - universal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Forth Valley (2,269)</td>
<td>ASQ 3 - highly selective</td>
<td>ASQ:SE - selective</td>
<td>Minimal</td>
<td>FV has trialled a variety of approaches to using questionnaires (ASQ, SDQ, and others) during 2013/14. Moving to more consistent use of ASQ in 2014/15</td>
</tr>
<tr>
<td>Grampian (5,048)</td>
<td>SOGS II - highly selective</td>
<td>Minimal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>GG&amp;C (8,878)</td>
<td>Minimal</td>
<td>SDQ - universal</td>
<td>SSLM - universal</td>
<td></td>
</tr>
<tr>
<td>Highland (1,930)</td>
<td>SOGS II - highly selective</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Highland and Argyll &amp; Bute CHPs have adopted different approaches to using questionnaires during 2013/14. Moving to more consistency in 2014/15</td>
</tr>
<tr>
<td>Lanarkshire (4,436)</td>
<td>SOGS II - universal</td>
<td>Minimal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Lothian (7,861)</td>
<td>ASQ 3 - universal</td>
<td>ASQ:SE - universal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Orkney (120)</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Minimal</td>
<td>More active use of validated questionnaires is currently being considered</td>
</tr>
<tr>
<td>Shetland (175)</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Minimal</td>
<td>More active use of validated questionnaires is currently being considered</td>
</tr>
<tr>
<td>Tayside (3,457)</td>
<td>ASQ 3 - universal</td>
<td>Minimal</td>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Western Isles (122)</td>
<td>Minimal</td>
<td>SDQ - universal</td>
<td>SSLM - universal</td>
<td>M-CHAT also used universally early in 2013/14</td>
</tr>
</tbody>
</table>

*Universal means questionnaire recorded as being used in ≥75% of reviews*

*Selective means ≥20 and <75% of reviews*

*Highly selective means ≥5 and <20% of reviews*

*Minimal means <5% of reviews*
Is the pattern of use of questionnaires associated with the quality of data on children’s development recorded on CHSP-PS?

Figure 1 shows the proportion of 27 month reviews that contained meaningful information on children’s development (no concerns, new concern, or previous concern) recorded against every developmental domain by Board, with the Boards grouped according to type of use of questionnaires. Additional figures (Figure 14 to Figure 17) in the Appendix show the proportion of reviews that contained meaningful information recorded against specific domains.

In general, data completeness was high: of the 42,642 reviews provided in 2013/14, 37,668 (88.3%) had meaningful information recorded against every developmental domain. No clear relationship between universal use of questionnaires and data completeness is evident. Only three Boards had data completeness of <90%: Grampian (88.1%), Highland (80.3%), and, in particular, Greater Glasgow & Clyde (70.4%). Further examination of the pattern of data completeness by domain shows that in Grampian and Highland, data completeness was similar for all developmental domains. By contrast, in Greater Glasgow & Clyde, data completeness was high for social/emotional/behavioural/attention and speech and language domains, intermediate for motor domains, and noticeably low for vision and hearing domains. Further analysis shows that data completeness was highly variable between Community Health Partnership areas within Greater Glasgow & Clyde (full data not shown but range from 34% in East Renfrewshire to 98% in West Dunbartonshire). This does suggest that, in some areas of Greater Glasgow & Clyde specifically, the use of questionnaires that focus on children’s social/emotional and speech and language development may have been associated with a relatively low level of assessment of, and hence data recording on, other aspects of children’s development.
Figure 1

% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for all developmental domains

The number under the Board name indicates the number of reviews included in the analysis
N=no concerns, C=concern newly suspected, P=concern/disorder previously identified

Universal use multi-domain tool
Universal domain specific tools only
Selective or minimal use of tools
Is the pattern of use of questionnaires associated with the identification of concerns about children’s development?

Figure 2 shows the proportion of 27 month reviews that had a ‘new concern’ recorded against any developmental domain by Board, again with the Boards grouped according to type of use of questionnaires. Subsequent figures (Figure 3 to Figure 6) show the proportion of reviews with a new concern recorded against specific domains. Note that the grouping of the Boards varies according the developmental domain being examined, reflecting the fact that some Boards universally offer questionnaires that assess some domains but not others.

A new concern about any developmental domain was identified in 6,397 of the 42,642 reviews provided (15.0%). The proportion of reviews identifying any new concerns ranged from 3/120 (2.5%) in Orkney to 31/122 (25.4%) in Western Isles (Figure 2). Overall, identification of new concerns was relatively low in the two Boards that made minimal use of questionnaires (Orkney and Shetland) and in one of the three Boards that made selective use of questionnaires (Grampian). In general, concerns were identified in a similar proportion of reviews in the various Boards that used questionnaires on a universal basis (and in the two remaining Boards making selective use of questionnaires namely Forth Valley and Highland), although concern rates appeared somewhat high in Western Isles.

Identification of concerns about specific developmental domains showed different patterns. Detection of concerns about social, emotional, behavioural or attention domains was relatively high in the two Boards universally using the SDQ. Rates were lower (and similar) in Boards universally using the ASQ:SE or a multi-domain tool only and in Forth Valley and Highland (Figure 3).

Regarding speech and language development, identification of concerns was relatively high in one of the two Boards universally using the SSLM (Western Isles). Rates were lower (and again similar) in the other Boards universally using the SSLM or a multi-domain tool only and in Forth Valley and Highland (Figure 4).

Identification of new concerns about motor development shows a clear relationship with questionnaire use. Identification rates were relatively high (around 3%) in Boards that universally used a multi-domain questionnaire incorporating assessment of children’s motor development, and relatively low (around 1%) in Boards that did not (Figure 5).

No clear relationship between the identification of new concerns about children’s vision or hearing and the (universal) use of questionnaires was evident (Figure 6). Rates were similar in most Boards although Dumfries & Galloway identified a relatively high proportion of children as having sensory problems. Further analysis
shows this was due to a high identification of new concerns about children’s hearing (data not shown).

All analyses were re-run including only the 37,668 reviews that contained meaningful information against every developmental domain: findings were very similar.

All analyses were also re-run looking at both previously identified and new concerns. In general, most of the concerns about children’s development identified at 27 month reviews are new. Any concern (previously known or new) was recorded in 8,072/42,642 (18.9%) reviews. The proportion of all concerns identified that were known about before the 27 month review varied by developmental domain. The proportion was relatively low for social/emotional/behavioural/attention (around 26%) and speech and language development (22%), intermediate for motor development (around 39%), and relatively high for vision and hearing development (around 50%). In general there was little variation between Boards in the proportion of children with previously recognised concerns in any of the individual developmental domains, although Grampian had the lowest proportion of children recorded as having a previously recognised concern/disorder in all domains. Consequently, looking at both previously identified and new concerns gave very similar results to looking at just new concerns in terms of relationship to pattern of questionnaire use.
Again (and throughout), the number under the Board name indicates the number of reviews (all, including those with incomplete data) that were included in the analysis.
Boards marked with * have had their results suppressed due to small numbers.
% 27 month reviews conducted April 2013-March 2014 identifying a new concern about speech and language developmental domain

Again (and throughout), Boards marked with * have had their results suppressed due to small numbers
Figure 5

% 27 month reviews conducted April 2013-March 2014 identifying a new concern about gross or fine motor developmental domains

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;A</td>
<td>2,971</td>
</tr>
<tr>
<td>Borders</td>
<td>866</td>
</tr>
<tr>
<td>D&amp;G</td>
<td>1,241</td>
</tr>
<tr>
<td>Fife</td>
<td>3,247</td>
</tr>
<tr>
<td>Lan'shire</td>
<td>4,436</td>
</tr>
<tr>
<td>Lothian</td>
<td>7,861</td>
</tr>
<tr>
<td>Tayside</td>
<td>3,457</td>
</tr>
<tr>
<td>Forth V</td>
<td>2,269</td>
</tr>
<tr>
<td>Gr'pian</td>
<td>5,048</td>
</tr>
<tr>
<td>GG&amp;C</td>
<td>8,878</td>
</tr>
<tr>
<td>Hi'land</td>
<td>1,930</td>
</tr>
<tr>
<td>Orkney</td>
<td>120</td>
</tr>
<tr>
<td>Shetland</td>
<td>175</td>
</tr>
<tr>
<td>W Isles</td>
<td>122</td>
</tr>
<tr>
<td>Scotland</td>
<td>42,642</td>
</tr>
</tbody>
</table>

Universal use multi-domain tool inc assessment of G&FM
Selective or minimal use of tool assessing G&FM
% 27 month reviews conducted April 2013-March 2014 identifying a new concern about vision or hearing developmental domains

Universal use multi-domain tool inc assessment of V&H
Selective or minimal use of tool assessing V&H
Is the pattern of use of questionnaires associated with the identification of concerns about deprived children’s development?

Different Boards serve very different populations. Differences between Boards in the proportion of children identified as having developmental concerns may therefore reflect these underlying differences in population (and hence risk of developmental problems) as well as different approaches to assessing development. To address this issue to some extent, all analyses were re-run including only children living in the most deprived areas of Scotland (SIMD deprivation quintile 1). As only Boards delivering at least 100 reviews to children living in quintile 1 over 2013/14 were included in the analysis, results for deprived children only are not available for Borders or the Island Boards.

Figure 7 shows the proportion of 27 month reviews carried out on children living in the most deprived areas that had a ‘new concern’ recorded against any developmental domain by Board. Additional figures in the Appendix (Figure 18 to Figure 21) show the proportion of reviews of deprived children with a new concern recorded against specific domains.

Compared to all children, a higher proportion of children from deprived areas were recorded as having new (and previously recognised) concerns about their development. During 2013/14 a total of 10,160 reviews were provided to children living in quintile 1, of which 2,189 (21.5%) had a new concern recorded against any developmental domain and 2,723 (26.8%) had a previous or new concern recorded. Comparing Figure 7 to Figure 2 shows that, although identification rates are higher for deprived children, the pattern of identification rates across different Boards is similar whether all children or just children living in the most deprived areas are included. In particular, identification rates are still relatively low in Grampian.

The pattern of identification of concerns about specific development domains in deprived children across Boards was also similar to that observed when all children were included.

When only deprived children were included, the identification of new concerns about social, emotional, behavioural or attention domains was still highest in the only included Board universally using the SDQ (Greater Glasgow & Clyde). Rates were lower (and similar) in Boards universally using the ASQ:SE or a multi-domain tool only and in Forth Valley (Figure 18). Identification rates amongst deprived children were intermediate in Highland and relatively low in Grampian.

Identification of concerns about speech and language development was similar in the included Boards universally using the SSLM or a multi-domain tool only and in Forth Valley and Highland (Figure 19). Identification rates were again relatively low in Grampian.
Identification of new concerns about motor development in deprived children were relatively high in Boards that universally used a multi-domain questionnaire incorporating assessment of children’s motor development, and relatively low in Boards that did not (Figure 20).

There was no clear relationship between the identification of new concerns about deprived children’s vision or hearing and the (universal) use of questionnaires (Figure 21). Concern rates (specifically concerns relating to hearing) were again relatively high in Dumfries & Galloway but otherwise similar between Boards.

Re-running the analyses of reviews delivered to deprived children including only reviews containing meaningful information against every developmental domain and, separately, including both previously identified and new concerns gave similar results.

Comparing the identification of developmental concerns in deprived children to identification in all children could be affected by inequalities in review coverage or in the quality of data on children’s development recorded on CHSP-PS forms. If the level of inequality varied between Boards, that would add further complications when examining the pattern of identified concerns about children’s development in deprived and all children across Boards.

Estimated review coverage over the first year of 27 month review delivery varied somewhat between Boards (Figure 8). It is important to reiterate that this is only estimated coverage based on the number of reviews provided and the number of 2 year olds estimated to be living in different Board areas. However, the results presented here are broadly similar to the (differently calculated) estimated coverage figures for all children previously released by ISD in the 27 month quarterly management information packs, although some discrepancies are seen for the smaller Boards. The observed variation in estimated coverage between Boards is explained in part by some Boards taking longer than others to get delivery of the reviews ‘up and running’ (in some areas due to a local policy of inviting children when they are approaching 30 rather than 27 months). Estimated coverage was particularly low in the early part of the year in some areas. The management information packs have shown that all areas have seen an improvement in estimated coverage over the course of the year however, and the degree of variation in coverage between Boards has lessened over time. Of particular interest from the point of view of this analysis, Figure 8 shows that in 2013/14 estimated review coverage in deprived children was similar to that in all children: no substantial inequality in estimated coverage was evident.
Furthermore, Figure 9 shows that the quality of information recorded on deprived children’s development on CHSP-PS 27 month review records was similar to that recorded on all children: no substantial inequality in data quality was evident.
% 27 month reviews conducted April 2013-March 2014 identifying a new concern about any developmental domain
Children resident in SIMD deprivation quintile 1 (most deprived) only
Estimated coverage of 27 month child health reviews, April 2013 to March 2014, by deprivation
Based on 2012 mid year population estimates of 2 year olds

[Bar chart showing coverage by area and deprivation level]
% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for all developmental domains, by deprivation.
To what extent are new concerns about children’s development identified in 27 month reviews isolated issues confined to single domains or more complex problems involving multiple developmental domains?

The previous sections suggest that the approach to using developmental assessment questionnaires within 27 month reviews does influence the number and type of developmental concerns that are identified. For example, any use of questionnaires is associated with higher overall identification of concerns, and universal use of a questionnaire that assesses all developmental domains is associated with higher identification of concerns about children’s motor development. One question that arises is therefore ‘Does identification of these ‘extra’ concerns about particular developmental domains matter?’ For example, if all children being identified as having motor development concerns are also being identified as having concerns about other aspects of their development, identification of the other concerns may be sufficient to trigger more detailed developmental assessment and support which would uncover and deal with any coincidental motor problems.

To explore this issue, the proportion of children being identified as having new concerns about particular aspects of their development that also had previous or new concerns identified about other developmental domains was examined (Table 2).

It can be seen that identification of multiple concerns about more than one area of a child’s development is common but not universal: 61% of children having a new concern recorded about their social and emotional development during their 27 month review were also recorded as having a concern about another aspect of their development (most commonly their speech and language). Comparable figures for children recorded as having a new concern about their speech and language; motor; and vision or hearing development were 45%; 75%; and 68% respectively. The figures were very similar when the analysis was restricted to children living in the most deprived areas. Broadly speaking, overlap figures were similar for all Board areas although Greater Glasgow & Clyde identified a relatively high number of children with ‘single issue’ concerns about social, emotional, behavioural, or attention domains only (data not shown).
Table 2: Concerns about multiple developmental domains, 27 month reviews, Scotland, 2013/14

All children

<table>
<thead>
<tr>
<th>Developmental domain</th>
<th>Children with new concern identified in the specified domain N</th>
<th>Children with new or previous concern in other domains N (%)</th>
<th>Children with previous concern in the specified domain or new or previous concern in any other domain N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SEBA Speech &amp; language Gross or fine motor Vision or hearing</td>
<td></td>
</tr>
<tr>
<td>SEBA</td>
<td>3,062</td>
<td>- 1,652 (54.0) 501 (16.4) 450 (14.7)</td>
<td>1,861 (60.8)</td>
</tr>
<tr>
<td>Speech &amp; language</td>
<td>4,204</td>
<td>1,500 (35.7) - 535 (12.7) 528 (12.6)</td>
<td>1,885 (44.8)</td>
</tr>
<tr>
<td>Gross or fine motor</td>
<td>918</td>
<td>495 (53.9) 574 (62.5) - 196 (21.4)</td>
<td>690 (75.2)</td>
</tr>
<tr>
<td>Vision or hearing</td>
<td>810</td>
<td>355 (43.8) 465 (57.4) 180 (22.2) -</td>
<td>548 (67.7)</td>
</tr>
</tbody>
</table>

Children resident in SIMD deprivation quintile 1 (most deprived) only

<table>
<thead>
<tr>
<th>Developmental domain</th>
<th>Children with new concern identified in the specified domain N</th>
<th>Children with new or previous concern in other domains N (%)</th>
<th>Children with previous concern in the specified domain or new or previous concern in any other domain N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SEBA Speech &amp; language Gross or fine motor Vision or hearing</td>
<td></td>
</tr>
<tr>
<td>SEBA</td>
<td>1,208</td>
<td>- 625 (51.7) 168 (13.9) 170 (14.1)</td>
<td>706 (58.4)</td>
</tr>
<tr>
<td>Speech &amp; language</td>
<td>1,348</td>
<td>558 (41.4) - 165 (12.2) 170 (12.6)</td>
<td>658 (48.8)</td>
</tr>
<tr>
<td>Gross or fine motor</td>
<td>272</td>
<td>170 (62.5) 187 (68.8) - 64 (23.5)</td>
<td>220 (80.9)</td>
</tr>
<tr>
<td>Vision or hearing</td>
<td>254</td>
<td>124 (48.8) 144 (56.7) 59 (23.2) -</td>
<td>174 (68.5)</td>
</tr>
</tbody>
</table>

SEBA is social, emotional, behavioural, and attention
Are ‘future action’ rates comparable in areas recording higher and lower rates of concerns about children’s development?

This analysis has shown that some Board areas are recording more concerns about children’s development following 27 month reviews than others. Higher concern rates could reflect higher detection of real problems (and hence meaningful opportunities for early intervention and improving children’s outcomes) and/or higher detection of trivial/transient issues of marginal significance.

There is no gold standard by which we can judge if the concerns identified and recorded are justified and likely to have a substantial impact on children. The results of any more detailed assessments done following 27 month reviews are not recorded on CHSP-PS. Similarly, no objective measure of children’s eventual developmental outcomes is routinely available. However, following 27 month reviews, Health Visitors are asked to record the future actions they intend to take to support the child and family on the CHSP-PS form (see Methods). Recording of an intended future action may therefore be viewed as a proxy indicator of the perceived seriousness of developmental concerns identified.

The percentage of all reviews, and just reviews that identified a new developmental concern, that had any intended future action recorded is shown in Figure 10 and Figure 11. Overall, an intended future action was recorded after 7,878/42,642 (18%) of all 27 month reviews. Not surprisingly, future action rates were considerably higher - 3,728/6,397 (58%) - when only reviews that had a new developmental concern recorded were examined (although it is notable that this means that 42% of reviews identifying a new developmental concern had no intended future action recorded). Recorded future action rates after identification of new developmental concerns varied between Boards, being low in Borders (19%) and Forth Valley (30%) and high in Greater Glasgow & Clyde (85%), but no relationship with developmental assessment questionnaire use, or overall concern identification rates was evident.
Figure 10

% 27 month reviews conducted April 2013-March 2014 with any intended future action recorded
% 27 month reviews conducted April 2013-March 2014 that identified a new concern about any developmental domain with any intended future action recorded

Universal use multi-domain tool
Universal use domain specific tools only
Selective or minimal use of tools
Figure 12 shows for Scotland as a whole the proportion of all reviews, and just reviews that identified a new developmental concern, that had each individual future action recorded. Actions relating to each service type are more common for reviews identifying developmental concerns. The most common actions recorded for reviews identifying developmental concerns relate to speech and language therapy, parenting support, early education, and audiology. Further analysis shows that actions relating to parenting support are relatively more common when a concern about social/emotional/behavioural/attention is noted. Similarly, as would be expected, actions relating to speech and language therapy; physio/occupational therapy; and audiology are more common when concerns about speech and language; motor; and hearing developmental domains respectively are recorded (data not shown).

Figure 13 shows the proportion of reviews that identified a new developmental concern that recorded an intended future action against each of the four commonest services service types. Overall, patterns of recorded future actions for children identified as having developmental concerns show many similarities between different Board areas. Some points of interest include particularly high future action rates relating to parenting support in Greater Glasgow and Clyde and to audiology in Dumfries & Galloway.
Figure 12

% 27 month reviews conducted April 2013-March 2014 with specified intended future action recorded, Scotland

S&LT is speech and language therapy
CAMHS is Child and Adolescent Mental Health Services
OT is occupational therapy
Figure 13

% 27 month reviews conducted April 2013-March 2014 that identified a new concern about any developmental domain with specified future action recorded
Discussion

This analysis has used information recorded on 27 month child health reviews delivered over 2013/14 to examine the different ways that Boards used developmental assessment questionnaires within reviews over that period and to explore any associations between questionnaire use and the quality of information recorded on children’s development; the identification of concerns about children’s development; and/or the actions taken to further assess and support children’s development.

Key findings can be summarised as follows:

- A total of 42,642 reviews were delivered across Scotland over the first year following their implementation (April 2013 to March 2014)

- Over 2013/14, Boards used a variety of approaches to using validated developmental assessment questionnaires within 27 month reviews

- Patterns of questionnaire use can be categorised as: universal use of a questionnaire assessing all developmental domains (with or without additional universal use of a questionnaire assessing social and emotional development specifically); universal use of questionnaires assessing selected ‘indicator’ developmental domains; selective questionnaire use; and minimal questionnaire use

- In general the completeness of data on children’s development recorded on 27 month review records was high, with almost 90% of records including meaningful information on all developmental domains

- Overall there was no clear relationship between questionnaire use and completeness of data on children’s development

- In some areas of Greater Glasgow & Clyde specifically, use of questionnaires assessing selected indicator domains only was associated with poor data completeness on other aspects of children’s development

- Identification of concerns about children’s development at 27 month reviews is fairly common: a new concern was recorded in 15% of reviews and a previous or new concern in 19% of reviews

- Overall identification of concerns was relatively low in the two Boards making minimal use of questionnaires (Orkney and Shetland) and one of the Boards using questionnaires on a selective basis (Grampian), suggesting that more systematic approaches to using questionnaires as part of reviews is associated with higher identification and recording of concerns about children’s development
• Universal use of the SDQ in Greater Glasgow & Clyde and Western Isles was associated with relatively high concern rates about children’s social/emotional/behavioural/attention development

• Universal use of the ASQ:SE along with the ASQ 3 was not associated with higher concern rates about children’s social/emotional/behavioural/attention development compared to universal use of a multi-domain questionnaire (ASQ 3 or SOGS II) alone

• Universal use of the SSLM was associated with relatively high concern rates about children’s speech and language development in Western Isles but not Greater Glasgow & Clyde (although note the overall number of reviews done in Western Isles was relatively small)

• Universal use of a multi-domain questionnaire was associated with higher concern rates about children’s motor development

• There was no clear relationship between questionnaire use and identification of concerns about children’s vision or hearing development. This may reflect the fact that questionnaires such as the ASQ simply prompt structured enquiry into any worries that parents have about children’s vision and hearing rather than asking about performance against specific milestones and Health Visitors may do this regardless of whether a questionnaire is being used or not

• Differences in concern rates between Boards were very similar when the analysis was restricted to children living in the most deprived areas only

• Looking at deprived children only ensures a more ‘like for like’ comparison between Boards and increases confidence that differences in concern rates are influenced by differences in developmental assessment approaches rather than differences in the populations served

• This approach is limited in inevitably excluding the smaller rural Boards. As the Northern and Western Isles have broadly similar population sizes and deprivation profiles, however, it seems likely that the very marked differences in concern rates identified in Island Boards relate more to their different approaches to developmental assessment than differences in underlying rates of developmental problems

• Identification of multiple concerns about various aspects of any individual child’s development is common but not universal. Around 45% of children with a new speech and language development concern also have another concern recorded. Overlap rates are higher for concerns about other domains: around 75% of children with a new motor development concern also have another concern recorded
• The recording of intended future actions at the end of 27 month reviews is variable between Boards with differences probably reflecting differences in local care pathways and protocols. There is no evidence that areas detecting more concerns are consistently less likely to record associated future actions (and hence no evidence that the ‘extra’ concerns being identified in these areas are viewed as trivial/not requiring a response)

The analyses presented in this paper have strengths and limitations. A full year’s worth of data on all 27 month reviews delivered across Scotland was included. In general, review coverage has been high across Scotland (particularly as the year progressed) and, when reviews are delivered, the information recorded on children’s development has shown high completeness. The pattern of use of questionnaires recorded on CHSP-PS has been confirmed with most Boards. Rates based on very small numerators have been suppressed to protect patient confidentiality. Results based on denominators of <100 have also been suppressed to guard against over-interpretation of potentially unstable rates. This limits some of the results available for the smallest Boards. No formal statistical testing of the differences in concern rates between different Boards has been included. This analysis is inevitably limited to what Health Visitors have recorded on 27 month review records. It is, for example, not clear to what extent recorded future actions actually took place.

This paper has been produced specifically to inform discussions about possible refinement of policy and guidance on assessing child development within child health reviews. Ideally, such policy would be based on robust randomised controlled trial evidence showing how different approaches to developmental assessment influence identification of developmental concerns, the validity of the concerns, children’s access to effective early intervention services, and ultimately children’s developmental outcomes. In the absence of such evidence, policy decisions still need to be made. It is therefore hoped that careful scrutiny of routinely available data can at least go some way to informing decision making, and the following tentative recommendations are therefore made as a starting point for debate.

Overall, the results presented in this paper support the general maxim that ‘The harder you look, the more you find’. They also suggest that, when it comes to child development, exactly how you look influences the detail of what you find. On balance, the results support the systematic use of validated developmental assessment questionnaires as part of the holistic appraisal of children’s development within child health reviews. Areas making the least use of questionnaires had concern rates below what would be expected based on what is known about the prevalence of developmental problems in the child population.
The results probably also support the *universal* use of questionnaires as concern rates were most variable/inconsistent in Boards using questionnaires on a selective basis. Making recommendations around *which* questionnaire(s) should be used on a universal basis is more difficult. Arguably, universal use of a single questionnaire that covers all developmental domains is the optimal approach. This approach is associated with reasonably high and consistent identification of concerns about all aspects of children’s development. Universal use of the ASQ 3 and SOGS II appear to lead to similar concern rates however other considerations may tend to favour use of the ASQ, including the availability of more extensive published research on its psychometric properties (Bedford et al 2013), its mandated use within the Family Nurse Partnership, and its universal use in England (Naughton 2014).

Although there are theoretical reasons supporting the use of the ASQ:SE along with the ASQ 3 (mainly relating to the high prevalence of problems with social/emotional development in this age group and the relatively light focus on social/emotional domains within the main ASQ 3), in practice this approach seems to add little in terms of identifying additional concerns about children’s social and emotional development.

The approach adopted by two Boards of universally using questionnaires specifically assessing children’s social/emotional and language development as ‘indicator’ domains provides an alternative approach. This approach has been associated with poorer data completeness relating to child development being recorded on 27 month review records, at least in some areas of Greater Glasgow & Clyde. This approach has also been associated with lower concern rates (compared to universal use of the ASQ 3 or SOGS II) relating to children’s motor development. By contrast, universal use of the SDQ has been associated with higher concern rates relating to children’s social/emotional development. The ultimate impact of this approach compared to universal use of a multi-domain questionnaire on children’s developmental outcomes is unclear, and this uncertainty could only be resolved through high quality research.

Factors supporting the use of the SDQ includes its free availability, extensive published information on its psychometric properties ([http://www.sdqinfo.com/](http://www.sdqinfo.com/)), and the growing body of evidence being gathered within Glasgow specifically on how SDQ results predict the results of full developmental assessment (Sim et al 2013 and further forthcoming publications from the same group). No Board has combined the use of a multi-domain questionnaire such as the ASQ with the SDQ hence that approach remains untested. Use of multiple questionnaires inevitably increases the assessment burden for both parents and Health Visitors however,
hence such an approach should arguably only be recommended if clearly superior to using a single questionnaire.

Overall, there would be benefit from a national comparative data point of view to all areas using the same questionnaire on a universal basis and capturing the actual ‘scores’ within the CHSP-PS return as well as the Health Visitor’s overall opinion regarding whether a concern exists. It should be emphasised that even if questionnaires are used on a universal basis, they should only be one facet of the holistic assessment of a child’s development within the broader context of their child health review. Some discrepancy between objective ‘scores’ and ‘concerns’ based on holistic professional judgement would therefore be expected. Finally, it is important to note that administering a questionnaire and capturing associated data should not become the point of child health reviews. The wellbeing, and meeting the associated needs, of an individual child and his/her family should remain the focus of every child health review.
References


Appendix

Data completeness by developmental domain

Figure 14

% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for social, emotional, behavioural and attention developmental domains

Figure 15

% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for speech and language developmental domain
% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for gross and fine motor developmental domains

<table>
<thead>
<tr>
<th>Region</th>
<th>Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;A</td>
<td>2,971</td>
</tr>
<tr>
<td>Borders</td>
<td>866</td>
</tr>
<tr>
<td>D&amp;G</td>
<td>1,241</td>
</tr>
<tr>
<td>Fife</td>
<td>3,247</td>
</tr>
<tr>
<td>Lan'shire</td>
<td>4,436</td>
</tr>
<tr>
<td>Lothian</td>
<td>7,861</td>
</tr>
<tr>
<td>Tayside</td>
<td>3,457</td>
</tr>
<tr>
<td>Forth V</td>
<td>2,269</td>
</tr>
<tr>
<td>Gr'pian</td>
<td>5,048</td>
</tr>
<tr>
<td>GG&amp;C</td>
<td>8,878</td>
</tr>
<tr>
<td>Hi'land</td>
<td>1,930</td>
</tr>
<tr>
<td>Orkney</td>
<td>120</td>
</tr>
<tr>
<td>Shetland</td>
<td>175</td>
</tr>
<tr>
<td>W Isles</td>
<td>122</td>
</tr>
<tr>
<td>Scotland</td>
<td>42,642</td>
</tr>
</tbody>
</table>

Universal use multi-domain tool inc assessment of G&FM

Selective or minimal use of tool assessing G&FM

% 27 month reviews conducted April 2013-March 2014 with meaningful information (N, C or P) recorded for vision and hearing developmental domains

<table>
<thead>
<tr>
<th>Region</th>
<th>Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;A</td>
<td>2,971</td>
</tr>
<tr>
<td>Borders</td>
<td>866</td>
</tr>
<tr>
<td>D&amp;G</td>
<td>1,241</td>
</tr>
<tr>
<td>Fife</td>
<td>3,247</td>
</tr>
<tr>
<td>Lan'shire</td>
<td>4,436</td>
</tr>
<tr>
<td>Lothian</td>
<td>7,861</td>
</tr>
<tr>
<td>Tayside</td>
<td>3,457</td>
</tr>
<tr>
<td>Forth V</td>
<td>2,269</td>
</tr>
<tr>
<td>Gr'pian</td>
<td>5,048</td>
</tr>
<tr>
<td>GG&amp;C</td>
<td>8,878</td>
</tr>
<tr>
<td>Hi'land</td>
<td>1,930</td>
</tr>
<tr>
<td>Orkney</td>
<td>120</td>
</tr>
<tr>
<td>Shetland</td>
<td>175</td>
</tr>
<tr>
<td>W Isles</td>
<td>122</td>
</tr>
<tr>
<td>Scotland</td>
<td>42,642</td>
</tr>
</tbody>
</table>

Universal use multi-domain tool inc assessment of V&H

Selective or minimal use of tool assessing V&H
Identification of concerns by developmental domain: children in deprived areas only

Figure 18

% 27 month reviews conducted April 2013-March 2014 identifying a new concern about social, emotional, behavioural or attention developmental domains
Children resident in SIMD deprivation quintile 1 (most deprived) only

Universal use tool specifically assessing SEBA
Universal use multi-domain tool only
Selective or minimal use of tool assessing SEBA

Figure 19

% 27 month reviews conducted April 2013-March 2014 identifying a new concern about speech and language developmental domain
Children resident in SIMD deprivation quintile 1 (most deprived) only

Universal use tool specifically assessing S&L
Universal use multi-domain tool only
Selective or minimal use of tool assessing S&L
% 27 month reviews conducted April 2013-March 2014 identifying a new concern about gross or fine motor developmental domains
Children resident in SIMD deprivation quintile 1 (most deprived) only

Universal use multi-domain tool inc assessment of G&FM
Selective or minimal use of tool assessing G&FM

% 27 month reviews conducted April 2013-March 2014 identifying a new concern about vision or hearing developmental domains
Children resident in SIMD deprivation quintile 1 (most deprived) only

Universal use multi-domain tool inc assessment of V&H
Selective or minimal use of tool assessing V&H