



## **Developing an Outcome Evaluation Framework for play@home**

### **Volume I: The Report**

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## **List of Abbreviations**

BAS	British Ability Scales
BSID-II	Bayley Scales of Infant Development Second Edition
CD	Cognitive Development
MS	Movement Skills
PA	Physical Activity
PAH	play@home
PCB	Parent Child Bonding
PEEP	Peers Early Education Partnership
PDMS-2	Peabody Developmental Motor Scales - Second Edition

## **Acknowledgements**

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## **Summary**

**Background:** This report explores the feasibility of and rationale for the design of an Outcome Evaluation Framework aimed at assessing the impact of the play@home scheme on the scheme's four main objectives: physical activity, movement skills, cognitive/language development, and parent-child bonding. The project was conducted in two interlocking phases. The first phase of "research" involved a scoping and review of the outcome evaluation literature alongside direct consultation with stakeholders (implementers, play@home coordinators) about current levels of outcome evaluation practice in the schemes. The second phase comprised the production of a draft "best practice" outcome evaluation framework, in conjunction with the expert judgements of measurement domain-specific outcome evaluation experts, the views of stakeholders and the advice of a Health Sciences statistician, experienced in the evaluation of complex interventions.

**Current Practice:** Information about current levels of outcome evaluation practice in each region was solicited via a brief electronic questionnaire and follow-up telephone interview from 10 identified regional play@home coordinators. Consultation with other potential play@home implementers (35 government employed child development/childcare workers) was undertaken to establish general awareness of play@home, current or intended use of play@home, and any other infant/preschool physical activity promotion schemes operating in their region. Nine of the 10 electronic evaluation questionnaires distributed to regional play@home coordinators were returned and follow-up telephone interviews were conducted with 7 of the respondents. Seven regional schemes were identified as actively using the play@home scheme and engaging in some form of evaluation practice with the majority basing their evaluations on the Parental Feedback Questionnaire contained in the play@home books. Although two of the active play@home programmes (Moray and Edinburgh pilot scheme) reported the use of domain-specific outcome evaluations no outcome evaluation data is yet in the public domain. Qualitative feedback, from telephone interviews with play@home coordinators, about outcome evaluation, revealed consistent support for the idea with most interviewees indicating evaluation to be both desirable and necessary. However, the majority of coordinators felt, in order to for it to be effective, that outcome evaluation needed to be centrally coordinated and independently administered. This view reflected the perception of a pre-existing burden on staffing capacities and thus limitations with respect to being directly involved in evaluation.

**Best Practice:** We conducted in-depth literature reviews in the areas of assessment/measurement of physical activity, movement skills, cognitive/language development, and parent-child interaction as well as a review of existing early years' interventions and associated outcome evaluations. This information was used to construct a draft "best practice" outcome evaluation framework (including outcome assessment rankings). Ranking of proposed outcomes was based on a specially devised ranking system examining measurement/psychometric properties and practical use. These rankings and the framework were subsequently distributed to an expert panel, of domain-specific measurement experts, for scrutiny and feedback. All experts agreed with our initial conclusion that, in the context of the proposed evaluation framework,

the best practice outcome measure(s) for (i) physical activity assessment would be the Actigraph accelerometer; (ii) movement skills assessment would be the Peabody Developmental Motor Scales (PDMS-2); (iii) Multi-Domain Assessment (involving Cognitive/Language/Parent Child Interaction) would be the Ages and Stage Questionnaire, with the British Ability Scales recommended as a test of 'intelligence'. The expert panels also recommended consideration of the Affordances in the Home for Motor Development (AHMD-SR) assessment of motor skills and the inclusion of both the Pleasure In Parenting Scale & Parent-Child Joint Activity Scale for inclusion in the outcome evaluation framework. The expert panel highlighted also that methodological work in accelerometry has great potential for measurement of habitual activity in toddlers and even infants but this is a severely under-researched area. Actigraph (accelerometry) validation work in the younger age group (under 3's) is recommended given the emphasis on the under 3's in play@home. The expert-validated draft outcome framework (summarised in table 7 of the report) was (along with additional information contained in Appendix VI) distributed to play@home professionals, for consultative feedback (via focus group, telephone interviews). Although we identified that currently there are two "active" play@home advisory boards in Scotland, in the Highland and Fife regions, we were only able to conduct a single focus group, aimed at discussing any potential barriers to the implementation of proposed outcome evaluation framework, with the Fife play@home advisory board. A summary of the issues emanating from the focus group indicated that any evaluation of play@home should (i) include outcome measures for dimensions such as bonding, socio-emotional development and movement skills development, which influence uptake of physical activity; (ii) give greater consideration of an outcome measure of physical activity for the 0-12 months group; (iii) be centrally managed with health visitor involvement; (iv) acknowledge the limitation of using a control group which will likely have been exposed to some form a physical activity intervention/promotion. In addition, to gain a true idea of the impact of the scheme it was felt important to also evaluate how often parents actually used the play@home books and/or whether they attended play@home groups.

**Conclusion:** On the basis of review of the literature on early years' interventions, consultation with play@home stakeholders and experts in measurement and evaluation we believe it is possible to conduct an outcome-based evaluation of all the domains (promoting physical activity, movement skills, cognitive/language development, parent-child bonding) of the play @ home programme in the pre-school group (4-5 years). A "menu" of sufficiently accessible and valid assessment methods has been identified (see Appendix III) and these are summarised in table 7 and schematically represented in the recommended outcome evaluation framework illustrated in figure 5. Currently, we believe it is not possible to assess the physical activity status of children younger than 3 years of age, thus compromising any comprehensive outcome evaluation of the scheme in infant and toddler groups as well as limiting outcome evaluation of the longitudinal impact of "whole scheme participation (0-5 years)". We believe that the most effective outcome evaluation of the scheme will be achieved independently of the scheme implementers. We recommend that a research-based outcome evaluation of play@home in pre-school group (4-5) is conducted as soon as possible to test the feasibility and utility of the proposed evaluation framework.

# **1 Introduction**

## **1.1 Background**

An emerging body of evidence suggests the importance of the very early years in terms of optimal social, cognitive (Diamond et al, 2007; Ball, 1994) and physical development (Gabbard, 2004). Although there are examples of successful early years interventions in the USA (Schweinhart et al, 2005; Schweinhart & Weikhart, 1997; McKey et al, 1985) there is a lack of this kind of evaluative research evidence in the UK, especially in Scotland.

Play@home is a Scottish baby/ toddler and preschool intervention. Play@home is based on a series of books developed in the Waikato Region of New Zealand, and was adapted and copyrighted for use in Scotland by Fife council (Irene Miller and Rosie Orr). This adaptation involved primarily a change in terminology, rather than content, to make the programme more culture-specific.

Play@home is series of 3 books aimed at babies (0-1 years), toddlers (1-3 years) and preschoolers (4-5 years). Collectively the aims of the play@home programme are:

- To encourage parents to establish daily health-related routines with their child.
- To develop good patterns of movement.
- To develop body awareness.
- To promote good movement patterns.
- To encourage enjoyment of physical activity.
- To promote the value of social interaction (playmates).
- To encourage parent-child bonding through loving touch (massage).
- To promote the value of parents exercising.
- To promote language development through communication.

The play@home programme is currently being run in some regions around Scotland (see Figure 3) and a national roll out of the scheme was launched 25/04/08. Evaluation of the programme is essential for:

- Assessing impact of the scheme on children and families.
- Audit and Quality Improvement
- Providing information to the public
- Programme and performance development
- Assessing value for money
- Assessing sustainability
- Increasing the evidence base

A previous evaluation of play@home (NHS Fife) concluded that it was not possible to assess the impact of play@home on measurable outcomes, due to 'lack of accessible and reliable information.' (Porter, 2006, NHS Fife Evaluation). While the 2006 evaluation was generally positive in terms of feedback received from parents and professionals, it is evident that there remains a need to objectively determine the impact of the scheme on measurable outcomes in families (children).

## 1.2 Aim of the Report

The aim of the current report was to explore the feasibility of and rationale for the design of an Outcome Evaluation Framework aimed at assessing the impact of the play@home scheme on the scheme's four main objectives: physical activity, movement skills, cognitive/language development, and parent-child bonding.

## 1.3 Methodology

The project was conducted in two interlocking phases. The first phase of "research" involved a scoping and review of the outcome evaluation literature alongside direct consultation with stakeholders (implementers, play@home coordinators) about current levels of outcome evaluation practice in the schemes. The second phase comprised the production of a draft "best practice" outcome evaluation framework, in conjunction with

the expert judgements of measurement domain-specific outcome evaluation experts, the views of stakeholders and the advice of a biostatistician.

### 1.3.1 Establishing Current Outcome Evaluation practices for the play@home scheme

Figure 1 summarises the investigative and consultation processes with the relevant stakeholder professionals (including, in this instance, play@home coordinators, play@home implementers, and child development/childcare workers). Contact details of all known regional play@home coordinators were provided (with permission) through Fife play@home coordinator Irene Miller. Initial contact with regional coordinators was then subsequently made by telephone at which time they were asked to:

- a. Complete a brief electronic questionnaire about current outcome evaluation of play@home in their region (see Appendix I for details of the questionnaire);
- b. Participate in a more detailed follow-up telephone interview about their experiences of current outcome evaluation practices of play@home (see Appendix II).

### 1.3.2 Regional spread / awareness of play@home

A list of 35 Government employed child development officers were identified and contacted to determine:

- a. awareness of play@home,
- b. current or intended use of play@home in their region,
- c. other infant/preschool schemes operating in their region.

These factors were important in identifying areas where there was no intention to use play@home, that may serve in future as potential "control"/comparison sample(s) for evaluations/research, and to determine similar schemes that may potentially influence/confound subsequent study results.

### 1.3.3 Selection of "Best Practice" Outcome Evaluation Measures

In-depth literature reviews in the areas of assessment/measurement of physical activity, movement skills, cognitive/language development, and parent-child interaction were carried out. A review of existing early years' interventions and associated outcome evaluations was also conducted. Review sources were electronic databases: Medline,

Psychinfo, Cochrane Library, Human Measurement Instruments; General Internet Searches (e.g. Google, Google scholar); Library databases and review article references. Search Terms employed included (for example) Physical Activity & Child\$ & Assess\$ & preschool or measure\$. Evaluation, early years & child\$. Movement skills or motor skills & child\$ assess\$. Literature Reviews are presented in Appendix III. The primary outcomes intended to be evaluated were extracted directly from the proposed aims of the play@home books (promoting physical activity, movement skills, cognitive/language development, parent-child bonding). To determine the most appropriate outcome evaluation measures to use, extensive reviewing of literature (both peer reviewed journals, and internet searching) was conducted to determine best practice methods of measurement of the proposed outcomes.

Ranking of proposed outcomes was based on a specially devised Ranking System (Appendix IV) examining measurement/psychometric properties (reliability and validity) and practical Use (feasibility in a large sample, age limits, cost, administration). The domain-specific outcome ranking was reviewed by an independent Expert Panel (see Appendix V for information about the expert panel).

#### 1.3.4 Focus Group consultation with play@home professionals

We identified that currently there are only two play@home advisory boards in Scotland, in the Highland and Fife regions. Moray region volunteered telephone interviews with lead Health Visitors and members of a Physical Activity & Health Advisory Board, but unfortunately they were not available till mid-end of May due to other commitments (too late for inclusion in report). Both advisory boards were invited to take part in a focus group interview. Unfortunately, only the Fife play@home advisory board were able to and/or agreed to take part. A focus group aimed at discussing any potential barriers to the implementation of proposed outcome evaluation framework was carried out with members of the Fife play@home advisory board. The focus group interview lasted approximately one hour and was audio-recorded and transcribed verbatim. Participants

Figure 1. Flow chart summary of investigative interaction with play@home Professionals.

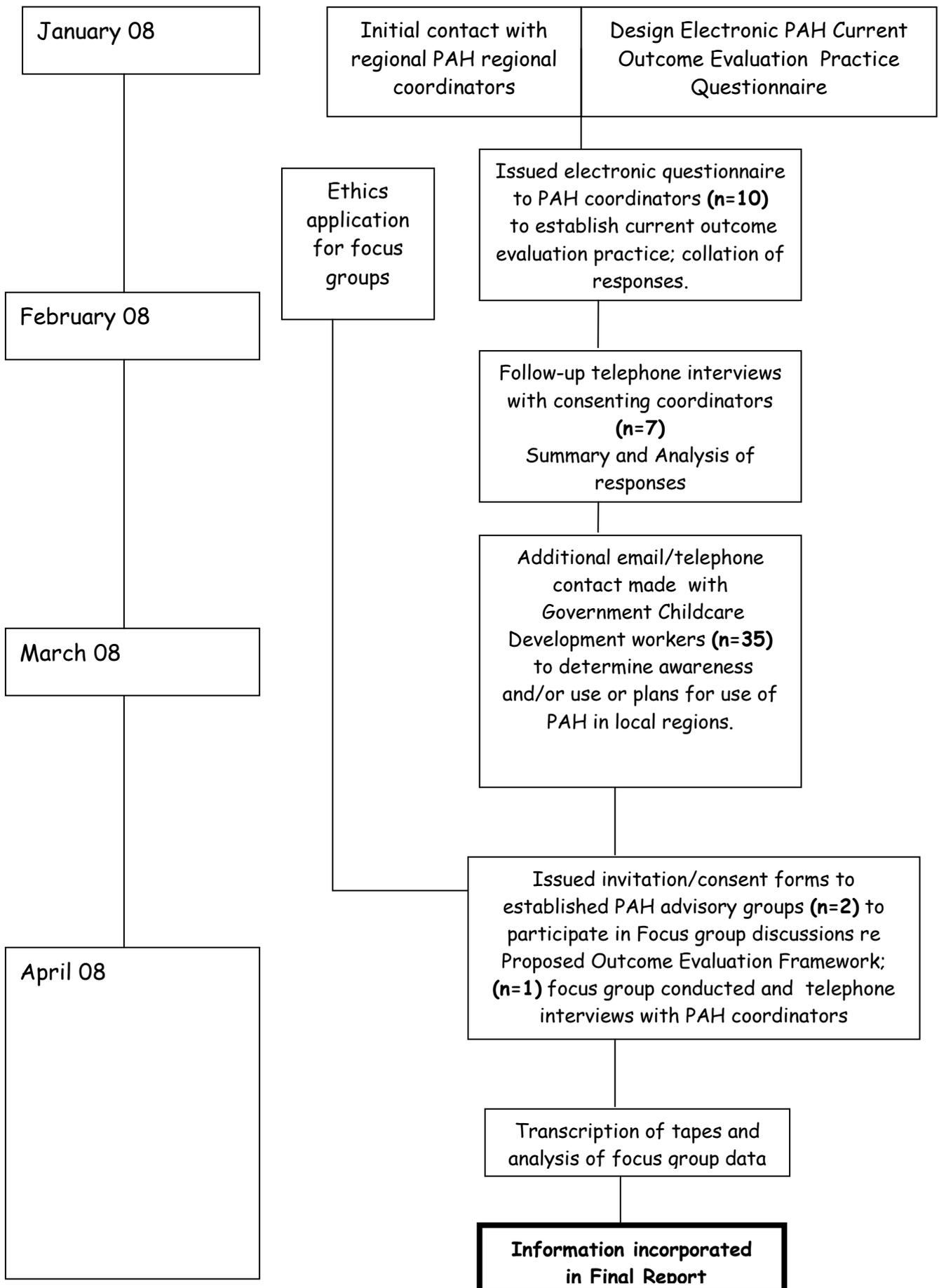
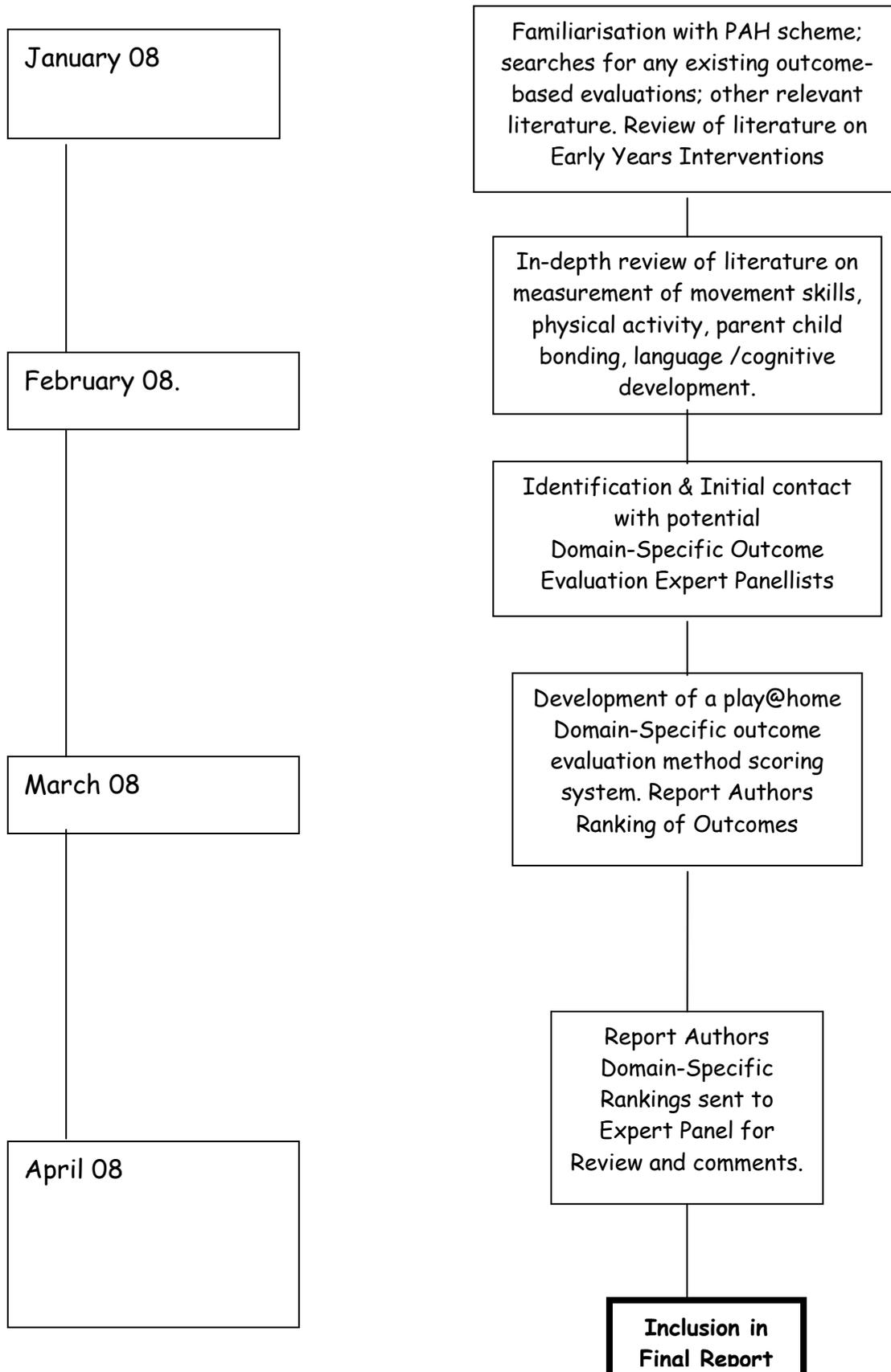


Figure 2. Flow chart summary of processes involved in selection of play@home outcome evaluation measures



were asked to provide feedback on the proposed evaluation framework. The data set was analysed by thematic analysis of content whereby the researchers coded the data set, identifying and categorising recurrent themes (Green & Thorogood, 2004).

## **2. Main Research Findings**

2.1 Regional Spread and current evaluation of play@home; quantitative feedback  
Of the 10 electronic evaluation questionnaires (see Appendix I for copy of questionnaire) distributed to play@home regional coordinators 9 were returned. Follow-up telephone interviews were conducted with 7 of the regional coordinators (see Appendix II for structure/script of semi-structured interview) to elicit more in-depth information about the use, year of introduction and current evaluation practices of the play@home scheme in their region. A summary of current evaluation practices are described in table 1. Further contact (through internet searching, location of list of child development workers, and child care provision websites) with (n=35) child development workers highlighted geographical areas where play@home was not used. This information is summarised in table 1, and Figure 3 (which illustrates the regional spread of the play@home scheme in Scotland).

During telephone interviews (n=7), and contact with child development workers (n=35), a number of other early years schemes were mentioned including a number of Government programmes (Active Start, Topstart/ Toptots, Peers Early Education Partnership (PEEP), Triple-P), and also privately funded franchises (Socatots, Gymboree). These were examined in more detail (by internet searching) to determine whether there was any overlap and/or conflict of content with play@home, or whether they incorporated any element of the play@home scheme.

Descriptions of these programmes and links to their independent evaluations (where carried out) are provided in table 2. Some had overlapping content: e.g. PEEP (language/cognitive), Topstart/Tots (movement/physical activity).

However, *play@home* appears to be unique in that:

- a. it is aimed at all children as opposed to being restricted to certain groups (e.g. Triple P),
- b. is aimed at parents as providers rather than primarily being delivered through educational establishments (Topstart/TopTots; Active Start), and
- c. aims to improve outcomes in numerous domains (physical activity, movement skills, cognitive/language, parent-child bonding).

Play@home also differs from other physical activity promotion schemes in that no equipment is required (except the parent books), giving the scheme the potential to be relatively low cost. Some programmes incorporate elements of play at home (e.g. Active Start; play@home video).

Information from telephone interviews with play@home coordinators indicated that the schemes are generally used to complement, rather than compete, with one other within a region. A typical comment in this regard is presented below.

*'I think Topstart and Toptots are really good, we use these, but they only go down to 18 months. We need something for the younger children, which is where play@home comes in.'* (Play@home Coordinator).

Table 1. Summary of current play@home evaluation practices.

Region	Comments	Evaluation				Evaluation
		MS	PA	PCB	CD	
Aberdeenshire	Not used.	N/A				N/A
Ayrshire	As part of Fit Ayrshire Babies .	x	x	x	x	Parental Feedback Questionnaire
Argyll & Bute		x	x	x	x	Parental Feedback Questionnaire
Borders	Decision taken not to use.	N/A				N/A
Dumbartonshire	Not used.	N/A				N/A
Edinburgh (Pilot Project)	Small Pilot study.	✓	✓	✓	✓	Structured Questionnaire (MT); Focus Groups ( MT); † Observation (MT)
Fife	>90% of parents receive books.	Parental Questionnaire.				Parental Feedback Questionnaire.
Highlands		Parental Questionnaire				Parental Feedback Questionnaire
Moray		✓	✓	✓	✓	Child Health Surveillance Programme (LT) Swim Baby Swim (LT)
North Lanarkshire	Not used.	N/A				N/A
Perth	To be implemented end of April 08.	N/A (not yet implemented)				Parental Feedback Questionnaire will be issued with books.
South Lanarkshire	Not used.	N/A				N/A

**MS** - movement skills; **PA**- Physical Activity; **PCB** Parent Child Bonding; **CD** cognitive development.

† no further information provided as didn't consent to telephone interview.

**Parental Feedback Questionnaire** asks for information on whether parents have books, have attended baby massage classes, and carry out massage at home.

MT - 4 -12 months.

LT - 12+ months.

Figure 3. Regional Map of Scotland highlighting areas where play@home is **used** and **evaluated** and, where known, the year of introduction of the scheme.

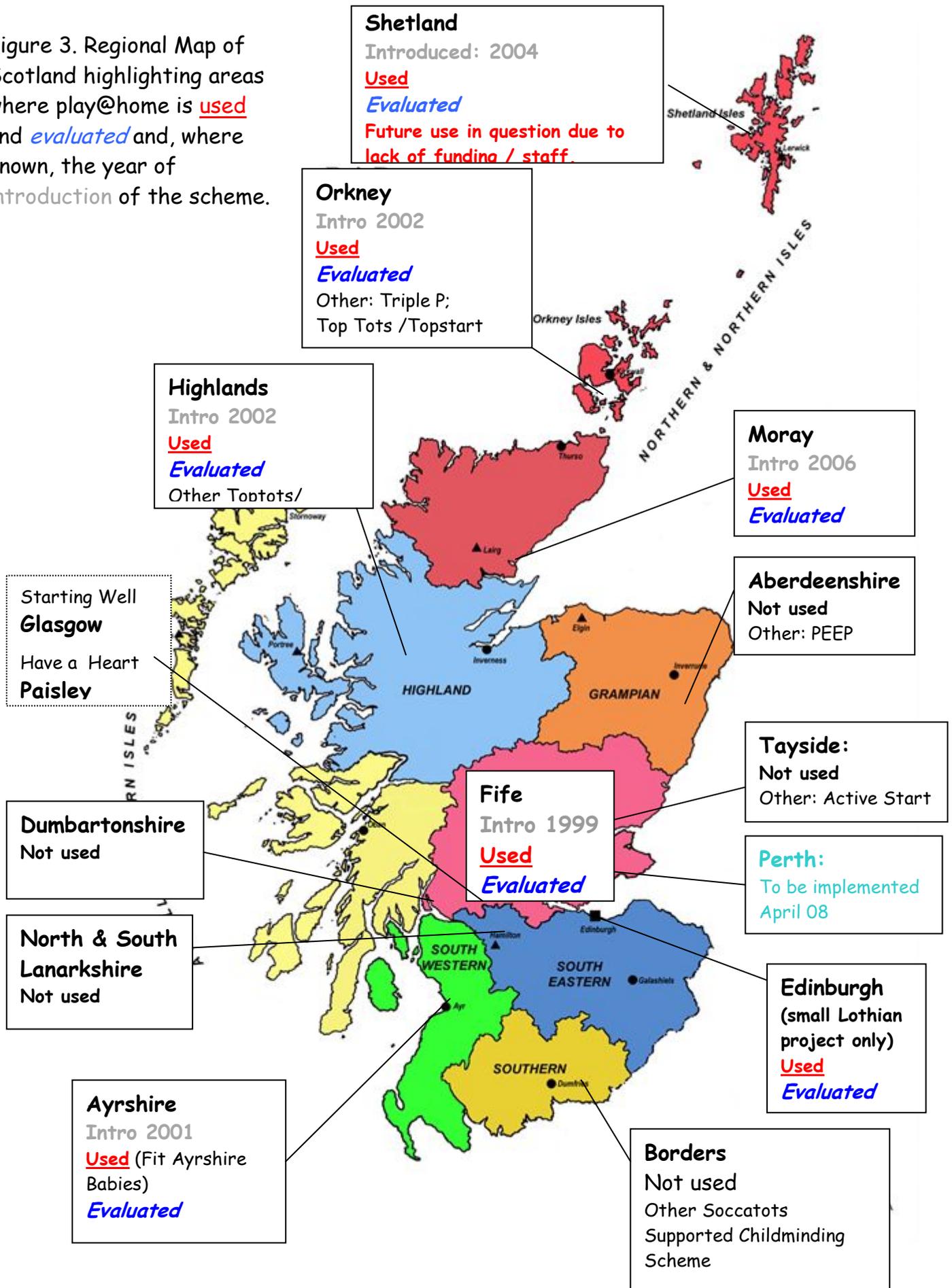


Table 2. Summary of existing early years' programmes in Scotland.

<b>Programme</b>	<b>Age Range (years)</b>	<b>Aim(s)</b>	<b>Target use</b>	<b>Format</b>	<b>Link</b>	<b>Incorporating play@home?</b>
<b>Topstart / Toptots</b> (being replaced by Start play April 2008)	18 months-5	To promote good movement patterns & balls skills	Preschools/ toddler groups. By health professionals.	Series of brightly coloured cards and toys.	<a href="http://www.youthsporttrust.org/page/top-start/index.html">www.youthsporttrust.org/page/top-start/index.html</a>	X
<b>Start Play</b> (Launched April 2008 to replace Topstart / Toptots.	0-5	To promote active 'play'	Childcare establishments / childminders / health professionals / parents.	Pilot stages: Playzone (to provide creative outdoor play areas in preschools / daycare etc.) Healthy eating info pack. Play cards. Parent Resource pack. Start to play training. CD of stories. Participation award wallchart. Start to play at home package (content not decided yet.)	<a href="http://www.youthsporttrust.org/subpage/playzone/index.html">http://www.youthsporttrust.org/subpage/playzone/index.html</a>	X  Will include a 'play at home' package, but content not yet decided.

Table 2. continued

<p><b>Active Start</b> (Clackmannanshire)</p>	<p>0-5</p>	<p>To promote social skills, gross motor skills, language and enjoyment of being active both indoors and outdoors.</p>	<p>Early Years Establishments</p>	<p>Sports equipment, staff training and a range of activities delivered within early years establishments.</p> <p>Incorporates play@home videos.</p>	<p><a href="http://www.ltscotland.org.uk/earlyyears/matters/previousissues/issue7/physicalactivity/activestart.asp">www.ltscotland.org.uk/earlyyears/matters/previousissues/issue7/physicalactivity/activestart.asp</a></p>	<p>✓ Play@home videos.</p>
<p><b>Fit Ayrshire Babies</b> (Ayrshire)</p>	<p>0-3</p>	<p>To raise awareness of the benefits of play, physical exercise and social interaction for children under the age of 3 years and their families.</p>	<p>Parents/carers, childminders, professionals who work with families with young children.</p>	<p>In service training for childcare providers. FAB cards and bags. Providing opportunities for physical activity (e.g. softplay, swimming).</p>	<p><a href="http://www.ltscotland.org.uk/earlyyears/matters/previousissues/issue7/physicalactivity/fab.asp">www.ltscotland.org.uk/earlyyears/matters/previousissues/issue7/physicalactivity/fab.asp</a></p>	<p>✓</p>
<p><b>Starting Well</b> (Glasgow).</p> <p>Independently evaluated by University of Glasgow. <a href="http://www.scotland.gov.uk/Publications/2005/04/20890/55054">http://www.scotland.gov.uk/Publications/2005/04/20890/55054</a></p>	<p>0-5</p>	<p>Numerous ('Improving child Health')</p>	<p>Numerous: e.g., health workers, support workers, groups.</p>	<p>Programmes of activities designed to support families. Ensuring parents and children have access to enhanced community-based resources.</p>	<p><a href="http://www.gorbalslive.org.uk/data/community/cgroups/startingwell.htm">www.gorbalslive.org.uk/data/community/cgroups/startingwell.htm</a></p>	<p>✓</p>

Table 2. continued

<p><b>Triple P (Positive Parent Project) (Part of Starting Well).</b></p> <p>Independently evaluated by University of Edinburgh.  <a href="http://www.healthscotland.com/documents/1254.aspx">http://www.healthscotland.com/documents/1254.aspx</a></p>	<p>Parents</p>	<p>To prevent behavioural, emotional and developmental problems in children (by enhancing the knowledge, skills and confidence of parents).</p>	<p>Media, Healthcare workers (with children with behavioral problems).</p>	<p>Multi-level.  Media. Sessions for parents with children who have behavioural problems.</p>		<p>×</p>
<p><b>Peers Early Education Programme (PEEP)</b></p> <p>Independently Evaluated by the University of Oxford.  <a href="http://www.dfes.gov.uk/research/data/uploadfiles/SSU2005SF017.pdf">http://www.dfes.gov.uk/research/data/uploadfiles/SSU2005SF017.pdf</a> Birth to School Study.</p>	<p>0-5</p>	<p>Aimed at improving life standards for children by improving cognitive and language skills.</p>	<p>Groups, home visits and materials aimed at promoting literacy.</p>	<p>PEEP materials, and opportunities to attend PEEP groups or received home visits.</p>	<p><a href="http://www.surestart.gov.uk/research/keyresearch/peep/">www.surestart.gov.uk/research/keyresearch/peep/</a></p>	<p>×</p>
<p><b>Soccatots™</b></p>	<p>2-6</p>	<p>To improve motor skills, colour recognition and other core aspects of child development.</p>	<p>Classes run in various settings (run by Socatots franchisees).</p>	<p>Soccer-specific play programme.</p>	<p><a href="http://www.socatots.com">www.socatots.com</a></p>	<p>×</p>

Table 2. continued

<p><b>Gymboree</b>™ (Paying classes in Glasgow, Bothwell, Edinburgh).</p>	<p>0-5</p>	<p>Physical, emotional and social development.</p>	<p>Classes run in various settings (run by Gymboree franchisees).</p>	<p>Age-specific parent child classes instructed by Gymboree staff.</p>	<p><a href="http://www.gymboreeuk.com/level5.php">www.gymboreeuk.com/level5.php</a></p>	<p>×</p>
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## 2.2 Regional Spread and current evaluation of play@home; qualitative feedback from telephone interviews with play@home coordinators.

A number of contextual issues were raised during the current evaluation practice telephone interviews, relating to the distribution of play@home books. It appears that to successfully implement the scheme, in terms of ensuring that a large percentage of parents actually receive the books, the almost unanimous view held was that the absolute minimum staff requirement is a coordinator, and an administrator (to issue books). In a well established, 'good practice' model (e.g. Fife), with relevant staffing, it can be demonstrated that >90% of parents receive the books within around 6 weeks of their child's birth. In other regions where there are acknowledged limitations in staffing even initial distribution of the baby book is compromised which has a knock-on effect on delivery of the toddler and preschool book. The "planned" cycle of distribution of books is schematically summarised in figure 4. For successful implementation of the scheme it appears to be essential that provision of the books is complemented by provision of adequate administrative support/staffing.

When questioned regarding current evaluation practices a number of consistent themes emerged included :

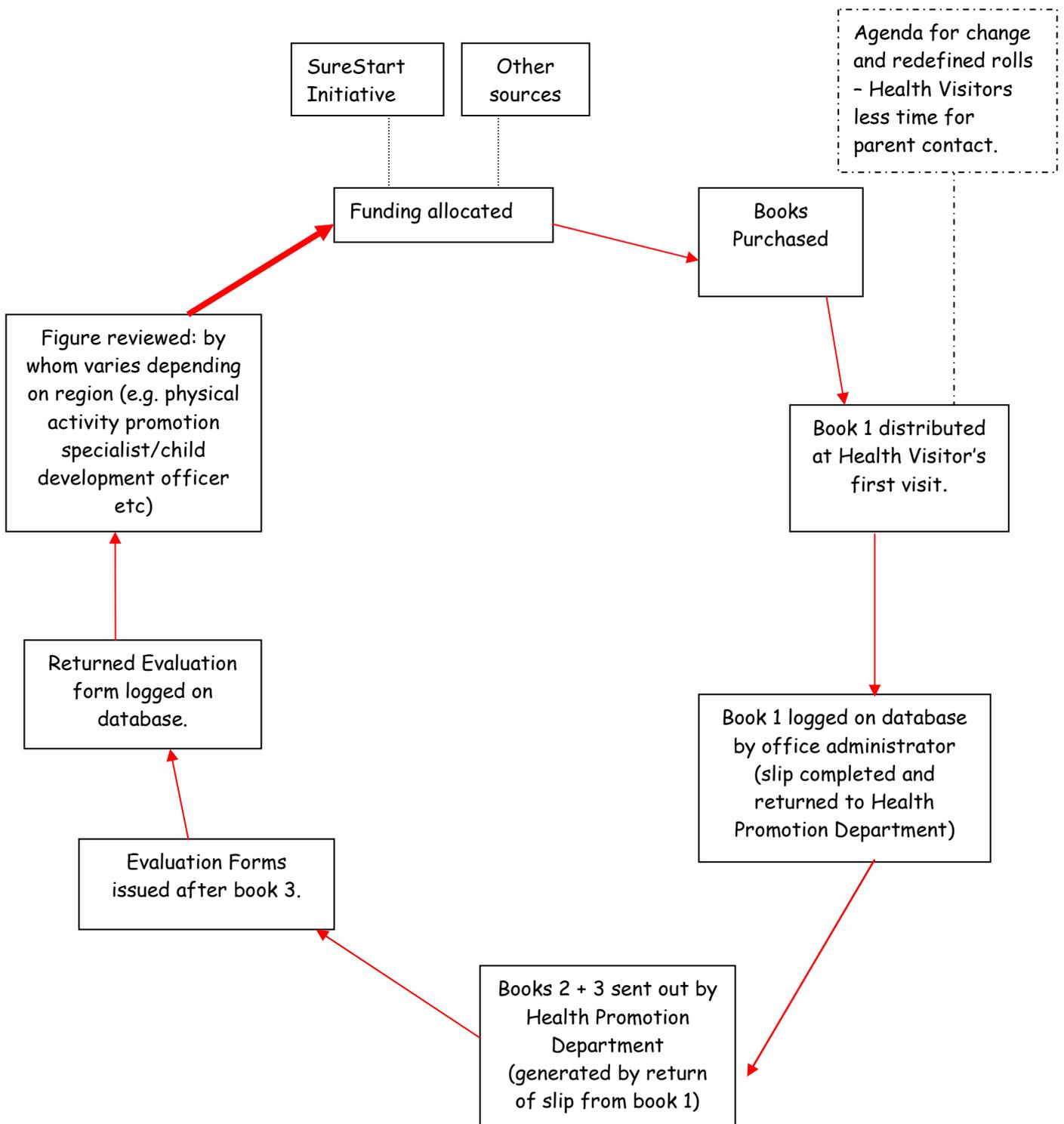
- a. Need for independent evaluation,
- b. Staff (or lack of), and
- c. Other uses of the play@home scheme.

Representative feedback comments are summarised in table 3, below..

Table 3. Representative Themes and selected quotes from telephone interviews with play@home coordinators.

<p><b>Theme: Need for independent evaluation.</b></p> <p><i>'We would love to be evidence based, but we just don't have the time or money.'</i></p> <p><i>'Most of use have a million other things under our job descriptions, and although anecdotally the feedback from staff (health visitors) and parents is very good, we don't have the time for an evaluation.'</i></p> <p><i>'Health visitors have so many things to go though with a new parent, and the new parent so much information to take in. Sometimes the book will be handed over without any explanation at all. That's unlikely to inspire the parent to use it, but it's a fact of life that they just don't have the time.'</i></p> <p><i>'Some health visitors who have used it are very enthusiastic. Some aren't - these are the ones who may be more likely to promote the scheme to parents if there was an evidence base.'</i></p>
<p><b>Theme: Lack of staff / time / funding to carry out an evaluation.</b></p> <p><i>'The basic minimum you need to make it (the play@home scheme) run successfully is a coordinator, and a member of administration staff. And that's just getting the books out to parents, never mind promoting it, and evaluating it.'</i></p> <p><i>'I take it an evaluation would be done somewhere centrally, rather than us having to do it? There's no way we'd have time for all that photocopying!'</i></p>
<p><b>Theme: Underlying fear that an outcome based evaluation will 'miss' potential benefits of play@home seen by users.</b></p> <p><i>'Although I think an evaluation is important, I'm worried that you will miss the benefits that we see using it individually with families that need 'extra attention'.</i></p> <p><i>'We tend to use play@home primarily as a tool to promote successful communication in families. And I'm convinced it works as I've seen it happen.'</i></p> <p><i>'When using play@home I can't tease out the parts that would promote physical activity, so if you focused just on that you would maybe get a negative finding. I can definitely see how it would improve gross and fine motor skills.'</i></p>
<p><b>Theme: Other uses for the play@home books / schemes.</b></p> <p><i>'It's an excellent tool for health visitors to use with families in need of more 'attention'.'</i></p> <p><i>'We tend to use it within parent baby / toddler groups, and demonstrate the exercises in the group. It adds a social element to the scheme, and is very successful especially in young mothers.'</i></p> <p><i>'There are some parents who will take the book and work their way through it, and others who prefer to come to a local group. The groups (e.g. baby massage) are usually parent -driven. It's the parents who ask for them.'</i></p>

Figure 4. Current implementation process and cycle of distribution of play@home books



## 2.3 Summary of Current Evaluation Practice

- Where?** Play@home is currently delivered or about to be delivered in 8 regions of Scotland. Seven regional schemes were identified as using the scheme and engaging in some form of evaluation practice (see Table 1 and figure 3 for details).
- What?** The majority (5/7) of (outcome) evaluations conducted were based on the receipt and evaluation of the *Parental Feedback Questionnaire* (contained within the play@home books). Although providing potentially useful information this does not specifically evaluate any of the four domain-specific outcomes of the scheme. Only two programmes (Moray and an Edinburgh pilot project) reported the use of outcome evaluations for each of the four outcome domains. Unfortunately no outcome evaluation data is yet in the public domain.
- How?** The views of Play@home professionals/coordinators were solicited about the need for, and mechanisms of, delivering outcome evaluation of the scheme. Support for the idea was evident with most indicating evaluation to be both desirable and necessary. However, almost unanimously, the coordinators felt, in order to for it to be effective, that evaluation needed to be centrally coordinated and independently administered

## 2.4 Selection of "Best Practice" outcome measures for play@home evaluation

In-depth literature reviews of outcome measures were carried out with identified outcome evaluation measures subsequently scored and ranked using the scoring sheet described in Appendix IV. The resultant ranking list of assessment domain-specific outcome evaluation measures were sent to an expert panel (see Appendix V for details of expert panel) for independent review and comments. Tabular summaries, illustrating the level of correspondence between our initial rankings and the judgements of the expert panellists are presented in tables 4a, 5a, and 6a.

### 2.4.1 Physical Activity

All experts agreed with our initial conclusion that the best practice for assessment of physical activity in the proposed evaluation framework would be the *Actigraph accelerometer* (see table 4.a) Although direct observation is the current criterion method for the measurement of physical activity in young children, it does not provide a

measure of free-living physical activity (the outcome of interest). Representative comments from the physical activity expert panel are shown in table 4.b.

Table 4.a. Author and Expert Ranking of Physical Activity assessments methods for future outcome Evaluation of play@home.

	<b>Author Ranking</b>	<b>Expert Ranking</b>	
<b>Accelerometer</b>	<b>1</b>	✓	✓
Actigraph (Actigraph LLC, Fortwalton Beach, Fla)	1		1
RT3 (Stayhealthy Inc. Monrovia, California)	2		3
Actical (Minimitter Respiroics, Bend, Ore)	3		2
<b>Pedometer</b>	<b>2</b>	✓	✓
Yamax DW/S2 200	1		
<b>Proxy Report</b>	<b>3</b>	<b>4</b>	✓
Parent & Teacher Log of Child Physical Activity (Manios et al, 1998)	1		
Parent & Teacher Report of Child Physical Activity (Harrow et al, 1998)	2		
<b>Direct Observation</b>	<b>4</b>	<b>3</b>	✓
CARS (Children's Activity Rating Scale) (Puhl et al, 1990)	1		
CPAF (Children's Physical Activity Form) (O'Hara et al, 1989)	2		
Behaviours of eating and activity for children's health evaluation system (BEACHES) (McKenzie et al, 1991)	3		
OSRAC-P (Observational System for Recording Physical Activity in Children) (Brown et al, 2006)	3		
FATS (Fargo Activity Time Sampling survey) (Klesges et al, 1984)	4		
SOPLAY (System for Observing Fitness Instruction Time) (McKenzie et al, 2000)	4		

Table 4.b. Key Comments of the Expert Panel on Physical Activity Assessment Ranking/Outcome Measures

Outcome	Comments
Physical Activity	<p><b>General comments on ranking:</b> I felt that the ranking was essentially correct. There might be a case for placing direct observation above proxy report (direct observation is still regarded widely as a gold standard in physical activity assessment), but this is a purely academic point since direct observation is not suitable for the kind of evaluation proposed (where habitual physical activity is the variable of most importance).</p> <p>The review is thorough and up to date and conclusions made are sound. I just have two suggestions to make</p> <ol style="list-style-type: none"> <li>1. I don't feel that there is a need to validate the GT1M Actigraph- it is essentially the same device as the previous Actigraph and can be used interchangeably with an adjustment for bias.</li> <li>2. I do feel that Actigraph validation work in the younger age group (under 3's) is required and is very important to this venture given the emphasis on the under 3's in Play At Home. Methodological work in accelerometry has great potential for measurement of habitual activity in toddlers and even infants but this is a severely under-researched area.</li> </ol> <p>It may be feasible to use a wrist worn Actigraph in infants, and is certainly an area worth investigating if this is an intended age group for evaluation. Validation work would need to be done, but I see no reason why you couldn't use and direct observation method as the criterion in very young children.</p> <p>The review seems to be very comprehensive and I have the following brief comment:</p> <ol style="list-style-type: none"> <li>1. I would probably rank the Actical before the RT3 based on the between instrument variability for the RT3. If I remember correct, Dale Eslinger published on this a few years ago.</li> </ol> <p><b>Any other suitable measures not mentioned:</b> Short term measurement of energy expenditure (using a portable calorimetry system such as the CosmedK4) has been used to validate other methods in two pre-school studies, but is unsuitable for measurement of habitual physical activity energy expenditure or habitual physical activity and this is presumably why it has not been considered as an option here.</p> <p>Even if we haven't published the data yet, the combined HR and movement sensing method appears to perform better than movement sensing alone in 4 to 5 year olds.</p> <p><b>Any other comments:</b> Proxy reporting unsuitable; prone to biases in reporting of activity by parents; very imprecise; available instruments unsuitable for these reasons (e.g. Scottish Health Survey Questionnaire of Physical Activity) and/or not well suited to Scotland ; don't capture habitual activity (e.g. Burdette proxy measurement by outdoor play).</p>

## 2.4.2 Movement Skills

Table 5a reveals the agreement of the expert panel with our initial judgment that the best practice for outcome assessment of movement skills in the proposed evaluation framework would be the Peabody Developmental Motor Scales (PDMS-2) (Folio & Fewell, 1983). While the Alberta Infant Movement Scales (AIMS) ranked highly (joint first by 2 experts and second by one expert), the upper age limit for the test is 3 years old. The PDMS-2 can be used across all intended age groups.

Table 5.a Author and expert ranking of Movement Skills Assessments

<b>Movement Skills Assessments</b>	<b>Author Ranking</b>	<b>Expert Rankings</b>		
Alberta Infant Movement Scale (Piper & Dara, 1994)	1	✓	✓	2
Peabody Developmental Motor Scales (PDMS-2) (Folio & Fewell, 1983)	1	✓	✓	1
Movement Assessment Battery for Children (MABC) (Hendersen & Sugden, 1992)	2	✓	✓	3
Test of Gross Motor Development (Ulrich et al, 1985)	3	✓	✓	4
BOTMP (Bruininks-Oseretsky Test of Motor Proficiency) (Bruininks, R.H. 1978)	4	✓	✓	5
<b>Multi-Domain Instruments (incorporating a movement skills element)</b>				
Bayley Scale of Infant Development.	1	✓	✓	✓
Ages & Stages Questionnaire (Squires et al, 1995).	1	✓	✓	✓
Battelle Developmental Inventory Screening Test (Newborg et al, 1984)	2	✓	✓	✓
Assessment, Evaluation and Programming System (Bricker et al, 1993; 1996)	3	✓	✓	✓

*Scores range from 1 - highest overall score to 5 - lowest overall score, and are based on a composite score of the checklist in Appendix A.*

*NB: Ranking is based on the overall scoring sheet in Appendix IV. Scoring is based on the requirements of the current study and is in no way generalisable, or reflective of the quality of the tests / items.*

*✓ = Expert agreement with author ranking.*

<b>Other outcome measures relating to movement skills for inclusion in any potential feasibility study</b>	Pilot / collect reliability data in UK children for possible inclusion in large-scale evaluation.
AHMED-SR (Gabbard, 2008)	

Table 5.b Relevant Comments on Movement Skills Assessment Ranking / Outcome Measures from Expert

Outcome	Comments
<b>Movement Skills</b>	<p><b>General comments on ranking</b>                      I generally agree with the evaluations. However, where applicable, I would have divided by age groups noted .The BOTMP, although a good research instrument, is marginally for preschoolers (4.5 yrs &gt;).</p> <p>Overall excellent job. I thought the PDMS would be best for the age-range of your project as it would allow you to use the same instrument for both infants and pre-schoolers. The Alberta Instrument would only be appropriate for infants.</p> <p><b>Any other suitable measures not mentioned:</b> In addition to the AIMS (Alberta Infant Motor Scale), if a qualified person is available, I would certainly consider the Posture and Fine Motor Assessment in Infants (2-12 months). This along with the AIMS, are excellent. Although we prefer the Peabody, others have a good argument for the Bayley II (1-42 months).</p> <p>The AHEMD-SR: affordances of motor development in the home environment. †</p> <p>If a measure of cognitive development is intended also, a tool with a valid and reliable movement skills and cognitive component could be used e.g. Bayley Scale of Infant Development (practical and training purposes) †.</p>

† Now included in recommendations

### 2.4.3 Multi-Domain Assessments: Cognitive/Language/Parent Child Interaction.

While the Bayley Scale of Infant Development (BSID-II) is generally recognised as a best practice (criterion) assessment of cognitive/language development (with a reliable and valid motor scale also) the Ages and Stage Questionnaire ranked higher overall as is very low cost, carries a low administrator burden, possesses good reliability and validity, covers multiple domains (movement skills, language and cognitive development, and socio-emotional development) and can be administered and scored by any trained individual. Therefore it is an excellent tool for a large scale evaluation. The expert panel agreed that this would be an excellent tool to facilitate multi-domain assessment for the proposed evaluation framework (see table 6a). The British Ability Scales are recommended as a test of 'intelligence' (for children aged >2.6 years).

Table 6.a Author and expert ranking of Multi-Domain Assessments

Multi-Domain Developmental Assessments	Author Ranking	Expert Ranking		
Ages & Stages Questionnaire (Squires et al, 1999).	1	✓	✓	✓
Bayley Scale of Infant Development II (Bayley, 2005)	2	✓	✓	✓
Battelle Developmental Inventory Screening Test (Newborg et al, 1984)	3	✓	✓	✓
Assessment, Evaluation and Programming System (Bricker et al, 1993; 1996)	4	✓	✓	✓
Denver II Developmental Screening Test (Frankenburg et al, 1990)	5	✓	✓	✓
<b>Intelligence Tests</b>				
British Ability Scales (Elliot et al, 1996)	1	1	✓	✓
Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III) (Wechsler, 2004)	1	2	2	✓
<b>Parent-Child Interaction Tools</b>				
<b>Direct Observation</b>	Parent-Child Interaction Tools not ranked, as each measure different age groups and / or elements of the parent-child relationship. Aim would be to include all. Experts asked to comment on appropriateness.			
Parent-Child Early Relational Assessment (0-3 years)				
<b>Proxy (Parent) Report</b>				
Pleasure In Parent Scale †				
Parent-Child Joint Activity Scale †				

† Recommended by expert.

Table 6.b. Relevant Comments on Multi-domain Assessment Ranking/Outcome Measures from Expert Panel

Outcome	Relevant Expert Comments
<p><b>Child Development Assessments</b></p>	<p><b>General comments on ranking:</b></p> <p>We used the Bayley scales when the children were 2 year olds, we used both the cognitive and behavioural subscales. By the time children were 3 we used the British Ability Scales (BAS) and we were able to calculate progress by using the Bayley as a pre and the BAS as a post</p> <p>You say in your spreadsheet that you need a specialist psychologist in order train for BAS, although this is true, once trained you can use highly skilled Research Officers to carry out the assessments under the supervision of the psychologists.</p> <p><i>(Regarding the Ages and Stages Questionnaire)</i> I can see the beauty of using a self-reported questionnaire as it reduces the cost and the time of the research considerably.</p> <p>I had a look at the Parent-child Early Relational Assessment, I think it is a wise choice as it is well used and I found a study published in 1999 explaining the validity of the scale.</p> <p><b>Any other suitable measures not mentioned:</b></p> <p>Pleasure In Parenting Scale &amp; Parent-Child Joint Activity Scale<sup>†</sup></p>

<sup>†</sup> Now included.

The comprehensive list of **recommended outcome measures** for use in the proposed play@home evaluation framework reflecting both the domains and age-ranges assessed are summarised in table 7. More detailed descriptions of these instruments and relevant additional information (e.g contact, purchase information; as provided to the focus group) can be located in Appendix VI. The information in Appendix VI was provided to play@home professionals for consultative feedback (via focus group, telephone interviews).

Table 7. Summary of recommended "best practice" measures for outcome evaluation of play@home.

Item	Domains Assessed						Age Range			
	Motor (Gross)	Motor (Fine)	Language	Cognitive	Socio-Emotional	Physical Activity	0-12 months	12-18 months	18-36 months	36-60 months
Actigraph Accelerometer ( <a href="http://www.theactigraph.com">www.theactigraph.com</a> )	x	x	x	x	x	√	? <sup>†</sup>	To be validated.	To be validated	√
AHEMD-SR (*Affordances in the Home for Motor Development) (Gabbard, 2008) <sup>††</sup>	√*	√*	x	x	x	x	Being validated.	√	√	Up to 48 months
Ages & Stages Questionnaire (Squires, 1995) <sup>††</sup>	√	√	√	√	√	x	√	√	√	√
Bayley Scale of Infant Development: Second Edition (Bayley, 1993).	√	√	√	√	x	x	√	√	√	Up to 42 months
British Ability Scales (Elliot, 1996)	x	x	√	√	x	x	x	x	30+	√
Parent-Child Early Relational Assessment (PCERA) (Clark, 1999)	x	x	x	x	PCR	x	√	√	√	√
Parent & Child Joint Activity Scale <sup>††</sup>					PCR					
Pleasure In Parenting Scale <sup>††</sup>					PCR					
Peabody Developmental Motor Scales (PDMS-2) (Folio & Feldwell, 1993)	√	√	x	x	x	x	√	√	√	√

PCR - Parent-Child Relationship

<sup>†</sup> Expert panel member suggested validation *may* be possible in infants (wrist worn) as well as toddlers. <sup>††</sup> Low cost or free proxy (parent) reports. Suitable for use in very large samples.

## 2.5 Qualitative Feedback on the proposed Outcome Evaluations (and Framework) from play@home professionals

The information in Appendix VI, and summarised in table 7, was distributed to play@home professionals, for consultative feedback (via focus group, telephone interviews). The unanimous view from the play@home professionals approached was that, even with the most basic of the suggested measures (proxy reports) the evaluation would ideally have to be carried out independently. Alternatively, staff roles would have to be re-designated to specifically accommodate any evaluation, as regional staff did not feel that they had the "spare capacity" to carry out an evaluation, and health visitors would not currently have the time.

### 2.5.1 Barriers to Implementation:

The following quotes reflect the consistently expressed view/feeling that, to be effective, the evaluation would have to be done centrally, rather than utilising health visitors; unless they were specially employed for the purpose.

'While I think it's an excellent idea, in reality the major barrier would be staff, there's no way we'd have the time to do that.'

'I take it this is to be done centrally? If so excellent idea, if not it's not feasible.'

'I (*health visitor*) could see myself using that questionnaire (*Ages & Stages*) occasionally, as I feel there have been certain circumstances where I've seen a marked difference in an individual child after using the (*play@home*) exercises with them, but there's no way any of us would have the time to use it on a larger-scale, and that seems the simplest of all the measures.'

'We do not have an administrator, anyone to carry out an evaluation or anyone to collate data. If we had means to evaluate play@home it would allow us to assess impact on our community.'

### 2.5.2 Other Issues / Concerns Raised

The scheme was rolled out nationally April 2008, and already exists to varying degrees in many regions (see Figure 3). It was felt that the existence of other preschool schemes and early years interventions, along with differing methods of health visitation

(e.g. Barker model of intensive visiting in Tayside) would make it extremely difficult to find a true 'control' group for any subsequent outcome evaluation of the scheme.

Concerns were also raised about the importance of exactly matching for socio-economic status, and how this would be done.

*'You'll never get a clean slate.'* (PAH Coordinator)

## 2.6 Play@home Focus Group feedback on the utility of the proposed outcome evaluation framework

Four participants from the Fife Regions took part in the focus group interview. The participants were:

Zoe Pattenden, Health visitor (ZP)

Yvane Mann, Health visitor (YM)

Audrey Manuel, play@home development worker (AM)

Irene Miller, Fife play@home Advisor/Coordinator (IM)

Three key themes were identified from the focus group interviews:

- Domains of measurement
- Evaluation design issues
- Practical issues

Each domain is discussed and direct quotes from the participants are used to illustrate the themes. Participants are referred to by their initials.

### 2.6.1 Domains of Measurement

While the participants of the focus group discussed witnessing improvement in factors such as bonding, socio-emotional development and language skills as a result of parents using the Play@home books it was difficult for them to ascertain improvement of physical activity in isolation:

*ZP: I understand that play at home programme is geared towards physical activity for life but I've never ever been able to tease out for myself that outcome. The socio-emotional and cognitive acquisition of language yes, but the physical activity and relating to decreasing perhaps outcomes that we are interested in,*

*obesity in children and so on and so forth I haven't been able to tease that one out for myself.*

Concerns were raised about adopting an outcome measure to quantify physical activity that was unable to capture dimensions, such as socio-emotional development and child bonding. Participants commented that these dimensions have an important influence on a child's ability to engage in physical activity and if overlooked, an evaluation might fail to provide 'true' evidence of the benefits of play@home:

*IM: Because if we are saying it doesn't make a huge difference for physical activity but it has a huge impact on families bonding and the relationships within families are so much better after using this programme then it gives us a better base for arguing, its still money well invested...*

*ZP: ...its just I would hate to see the play at home programme fall foul to an outcome that becomes very narrow, that's my anxiety ... well what could be teased out is the confidence that 'Play@home' nurtures in families when they engage with it, will then give them confidence to go on and engage with their children in physical activities as they develop through their years*

*IM: Even for the children themselves and the confidence that they have gained in having the good gross and fine motor skills and the good social skills will enable them to access new environments more clearly so for example a child going into nursery in school, being a more confident child is then gaining a better benefit from those other environments.*

The suggested 'Ages and Stages' questionnaire was viewed positively by participants as it was able to capture domains such as bonding, language, socio-emotional and movement skills development in addition to a measure of physical activity.

Participants raised the fact that one of the unique aspects of play@home is that it specifically aims to work with young children. The focus group discussed that it would be highly beneficial to gain some kind of measure of physical activity, or sedentary behaviour, in the 0-12 months age group, as from their experience as health visitors, many children were often left in 'car seats, pram, buggies' for large proportions of the day, and the play@home activities may encourage parents to 'lift them out of the seats'

*ZP: Can you do it in another age range [talking about accelerometers] because play@home exercises starts on about 6 months and they actually do physical*

*activity, albeit facilitated by the parent but that's all part of the play@home strategy, the activity is physically facilitated and if someone is actually doing that activity and there is a means of measuring it, then you are seeing the effect...*

*YM: I think that's when you're getting your best data*

Contact with the Expert Panel indicated that it would be feasible to attempt to validate the accelerometer as a measure of sedentary behaviour in infants, and would be a highly worthwhile.

The participants discussed that the success of the play@home booklets depends not only on having health visitors who are trained to use the books but who can also provide additional support to parents using the play@home books. In Fife region, parent groups supported by health visitors, such as 'Baby massage classes', now exist:

*YM: 'Cos if as you say the books are going to be given out in a region and because it's free then they are going to sign up for it and they are going to give it out to Mums and if there is nothing goes along with it then it is going to get put in the pile with everything else...*

*ZP: The professionals giving out that book have to also have signed up to the spirit of it*

*IM: That's why we need to have training because the professionals need to actually sit down and look at what's in it now..... its not likely they are going to look at this and say it is not part of their practice.*

Consideration in an evaluation needs to be given to the influence of the parent groups and the support from health visitors as this may have an important impact on the uptake and success of play@home.

## 2.5.2 Evaluation Design Issues

The participants raised some important points for consideration in relation to the designing of any evaluation. One participant highlighted the difficulty with finding a control group to act as a comparison to a play@home intervention group. They

commented that there would be few areas in Scotland where children had not been exposed to some kind of physical activity intervention:

*IM: I don't think you'll find anywhere that has no intervention, I think for us the key is that we have intervention at birth. Lots of areas have information like 'Ready, steady baby' but that's not a specific physical activity programme, its about good parenting and good child care but its not about specific physical activity... You're never going to have a clean slate.*

This participant went on to say that the evaluation needed to be longitudinal:

*IM: it has to be longitudinal, in order to see that there are physical skills developing here due to giving this programme*

Table 8. Summary of potential barriers to outcome evaluation raised by play@home professionals.

<b>Potential Barriers to Implementation</b>	<b>Suggestions</b>
<b>Insufficient Staffing for Evaluation</b>	Evaluation done independently. Staff (e.g.) Health visitors on secondment?
<b>Varied Skills / training required</b>	Central evaluation team, training of researchers.
<b>Missing potential benefits of scheme.</b>	Multi-domain assessments included to get a broad range of developmental measures that could potentially be influenced by the scheme.
<b>Study Design Issues (Difficulty getting a true comparison community).</b>	Identify area where roll-out will be delayed due to training, and follow-up / examine compliance.
<b>Identification of participants.</b>	Health visitors approach parents during initial visit, slip completed and returned to central evaluation team.

### 2.5.3 Practical issues for consideration in an evaluation

Participants discussed recruitment and how the evaluation would be administered. The current workload of health visitors may make administrating the evaluation prohibitive and a suggestion was for the evaluation to be centrally managed:

*ZP: ...I think where we might fall down if we are doing this study, is if we don't have this being done centrally and properly and I think there then would have to be funding for that and I think there would have to be an identified person to look*

*after it and indeed prompt people to remember to either email them, attach them or send them or fill them.*

To recruit a control group the health visitors recommended involving the Child Health Department. While it was argued that an evaluation should be centrally managed the participants raised issues that would make involvement of health visitors in the recruitment process important:

*AM: Another concern that I know has been raised before is the issue if the child then died or the child was ill...*

*IM: It may be in issue but you would need to come back to the health visitor and say we are going to include this set of families and ask 'can I just check with you first that nothings happened?'*

A suggestion for recruitment of the Play@home group was through using a tear-off slip from the current registration form:

*IM: Now we already have got a system that is working with the new print run and we spoke about having the registration slip continued and they wanted to do that..., so that could be part of the national roll out as part of registration ...*

*YM: ...they could just give their signature to say that and they could be contacted for an evaluation....they could just tick for their details to be passed to allow to be contacted for evaluation purposes...*

*IM: ...but only with regard to evaluation of thePlay@home programme*

*YM: ...but if that was there and they just ticked that...*

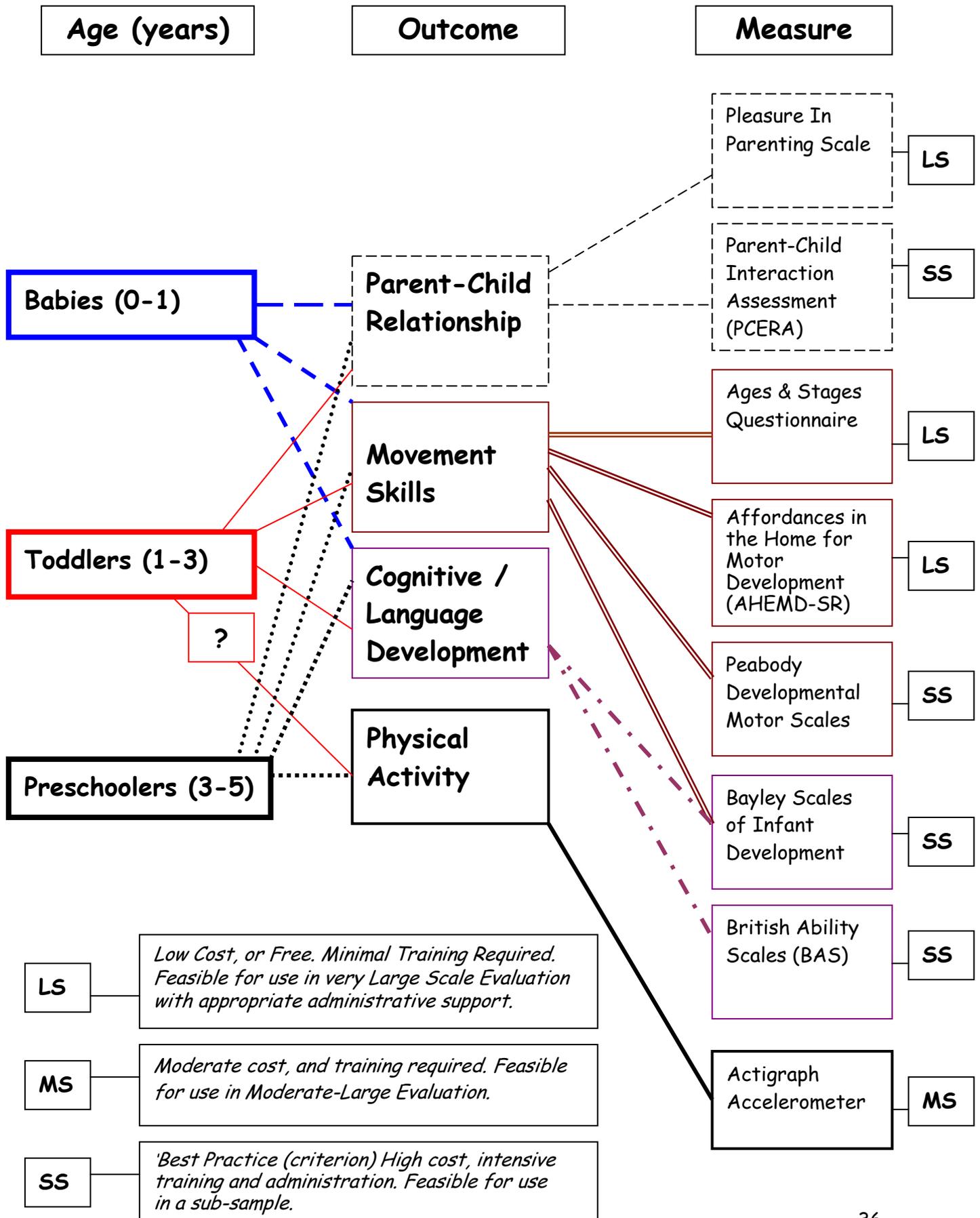
In evaluation, to gain a true idea of the impact of the scheme, even within a best practice area, it would also be important to evaluate how often parents actually used the play@home books and/or whether they attended play@home groups. It was suggested that a diary or retrospective recall of use would not be appropriate, as parents who use the programme often do not refer back to the books once they are familiar with the exercises, or if they have learned in a group setting they may use the activities and exercises, but would not necessarily be able report to report this accurately. Working with the implementers, the aim would be to identify the key

activities in each book, and develop a questionnaire based on this. As an example, questions included in the questionnaire could be "*How often do you play 'Peekaboo' with your child?*" and "*Do you know the words to this (insert name of rhyme) nursery rhyme?*".

#### 2.5.4 Summary of focus group findings

- An evaluation of play@home should include outcome measures for dimensions such as bonding, socio-emotional development and movement skills development which influence uptake of physical activity.
- Greater consideration for an outcome measure of physical activity for the 0-12 months should be used.
- An evaluation should be centrally managed with health visitor involvement.
- The limitation of using a control group which will have been exposed to a physical activity intervention should be recognised.
- To gain a true idea of the impact of the scheme, it would be important to evaluate how and how often parents actually used the play@home books or whether they attended play@home groups.

Figure 5. Schematic summary of Final Recommended Outcome Evaluation Framework



### 3. Outcome evaluation study design considerations

Appropriate selection of the primary outcome variable is a key issue in the evaluation of any such potentially complex intervention as the study/evaluation designed will be "powered" in relation to the known characteristics of this variable, with associated implications for sample size estimates. This issue is further compounded with regard to the play@home scheme by the explicit statement that the scheme is designed to promote all of four outcomes; physical activity, movement skills, cognitive/language development, and parent-child bonding. However, given the public health importance of physical activity behaviour for pre-children, as a potential vector for childhood obesity, we recommend that physical activity be designated as the primary outcome variable for any evaluation of play@home. Ideally, any (primary) outcome assessments should be capable of detecting change in behaviour throughout the individual child's participation in the scheme (1-5 years). This, in turn, brings its own problems as currently the recommended method of physical activity assessment is only validated in children 3+ years of age.

We recommend that the best way to examine the impact of play@home is to select a region without previous exposure and randomly assign half of parents to receive the scheme with the other half acting as controls (randomised-controlled trial 'gold standard'). Alternatively, again sampling from a non-exposed region, one could examine changes in outcomes using a within-subjects design pre-post introduction of the scheme, incorporating an intention to treat analysis approach. In this instance it would be particularly useful, and important, to define and assess actual compliance to the scheme as this would facilitate post-hoc analyses of sub-samples with potentially varying compliance profiles.

Another approach, albeit with a slightly less robust research design, would involve cross-sectional comparison of outcomes (physical activity levels) between an identified 'good practice' region, where play@home has been/is being implemented (e.g. Fife) and a demographically-matched (age, gender, SES etc) comparison community with no previous/current exposure to the scheme. This would probably need to focus on pre-school children who were at least 4 years of age. Limitations of this approach include

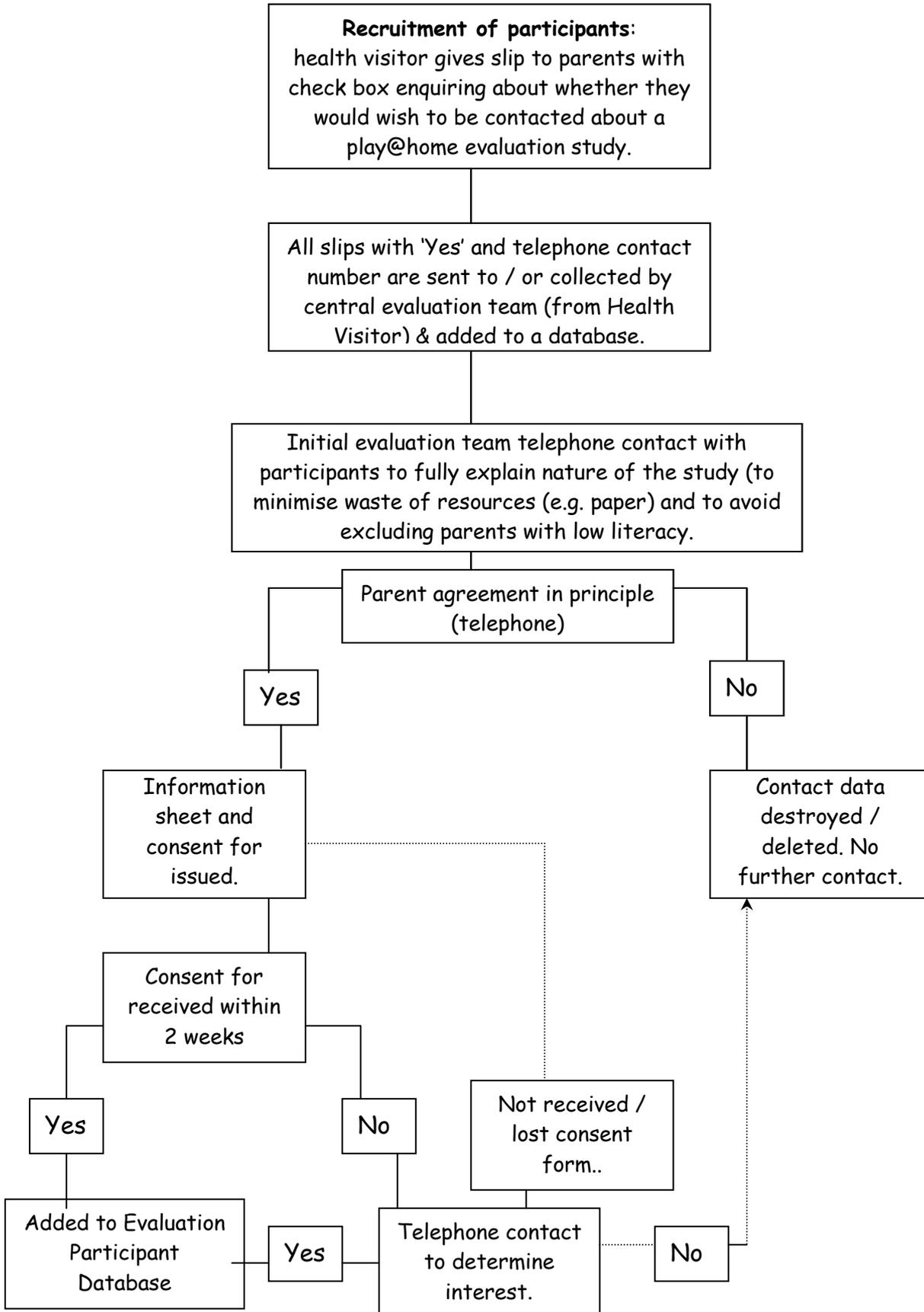
the potential confounding effects of previous exposure to other early years schemes, clustering of physical activity/psychological outcomes, socio-economic status, and environmental influences. However, a recent study, employing a similar design, indicated that ~40 pairs of well-matched pre-school children would need to be sampled to detect a difference of 100 accelerometer counts per minute. Sample 4 year old cohorts in each region could then also be prospectively followed for a period of at least one year.

Discussion with play@home professionals has indicated that a staggered scheme roll out will operate due to necessary training of staff prior to implementation. This logistical constraint would thus "maintain" areas where the scheme will not be implemented in the near future and would afford this research design possibility. Recruitment of parents to any evaluation could be facilitated by nominated health visitor(s) (as summarised in the recruitment process schematic depicted in figure 6). This method of recruitment was favoured by focus group participants.

#### **4. Conclusion**

There is little evidence of systematic outcome-based evaluation of the play@home scheme. Stakeholders in play@home value the idea of outcome evaluations but do not feel that they have either the resource or time to routinely be involved in outcome evaluation of the scheme. On the basis of review of the literature on early years' interventions, consultation with play@home stakeholders and experts in measurement and evaluation we believe it is possible to conduct an outcome-based evaluation of all the domains (promoting physical activity, movement skills, cognitive/language development, parent-child bonding) of the play @ home programme in the pre-school group (4-5 years). A "menu" of sufficiently accessible and valid assessment methods has been identified (see Appendix III) and these are summarised in table 7 and schematically represented in the recommended outcome evaluation framework illustrated in figure 5. Currently, we believe it is not possible to assess the physical activity status of children younger than 3 years of age, thus compromising any comprehensive outcome evaluation of the scheme in infant and toddler groups as well as limiting longitudinal outcome evaluation of "whole scheme participation". There is thus a

Figure 6. Possible Recruitment for Play@home evaluation (discussed with and supported by Health Visitors in Focus Group).



need for identification and validation of an objective physical activity measure for use with 0-1 and 1-3 year old groups. Opportunities for large-scale randomised controlled trial type outcome evaluations of the scheme are diminishing with the spread of regions actively involved, previously involved or proposing to be involved with play@home. Research-based outcome evaluations may have to consider quasi-experimental or cross-sectional approaches.

## **5. Recommendations**

The following recommendations relate to the challenge of how to implement and operationalise any outcome evaluation of play@home:

- Conduct a research-based outcome evaluation of play@home in pre-school group (4-5) as soon as possible to test the feasibility and utility of the evaluation framework
- Following the scheme "roll-out" all regions delivering play@home should be mandated to incorporate some element of outcome evaluation of the scheme
- Where possible, outcome evaluations should be independently conducted and centrally managed with health visitor involvement
- Encourage/support an element of standardisation (within the recommended "menu" of assessment tools) in outcome evaluation of play@home
- Training in the conduct and administration of outcome evaluation be provided for designated implementers (possibly health visitors)
- An evaluation of play@home should consider including outcome measures for dimensions such as bonding, socio-emotional development and movement skills development which may influence uptake of physical activity.
- Attention be given to identifying, developing and/or validating an outcome measure of physical activity for the infant group (0-12 months).
- Establish validation of accelerometer-based assessment of physical activity in toddler group (1-3 years)

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