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1 **The challenges of quantitative evaluation of a multi-setting,**  
2 **multi-strategy community based childhood obesity prevention**  
3 **program: lessons learnt from the *eat well be active***  
4 **Community Programs in South Australia**

5  
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26  
27 **Key words:** community-based obesity prevention, evaluation, childhood

28  
29 **Short Running Title:** Evaluation of the *ewba* Community Programs

30

31 **Abstract**

32 *Objective:* To describe the rationale, development and implementation of the  
33 quantitative component of evaluation of a multi-setting, multi-strategy, community-  
34 based childhood obesity prevention project (the *eat well be active (ewba)* Community  
35 Programs) and the challenges associated with this process and some potential solutions.

36 *Design:* *ewba* has a quasi-experimental design with intervention and comparison  
37 communities. Baseline data were collected in 2006 and post-intervention measures will  
38 be taken from a non-matched cohort in 2009. School children aged 10-12 years were  
39 chosen as one litmus group for evaluation purposes.

40 *Setting:* Thirty-nine primary schools in two metropolitan and two rural communities in  
41 South Australia

42 *Subjects:* 1732 10-12 year-old school students completed a nutrition and/ or a physical  
43 activity questionnaire and 1637 had anthropometric measures taken; 983 parents, 286  
44 teachers, 36 principals, 26 canteen and 13 out of school hours care workers completed  
45 program-specific questionnaires developed for each of these target groups

46 *Results:* The overall child response rate for the study was 49%. Sixty- five, 43, 90, 90  
47 and 68% of parent, teachers, principals, canteen and out of school hours care workers  
48 respectively, completed and returned questionnaires. A number of practical, logistical  
49 and methodological challenges were experienced when undertaking this data collection.

50 *Conclusions:* Learnings from the process of quantitative baseline data collection for the  
51 *ewba* Community Programs can provide insights for other researchers planning similar  
52 studies with similar methods, particularly those evaluating multi-strategy programs  
53 across multiple settings.

54 *Trial Registration:* ACTRN12607000414415

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## 60 **Background**

61 The prevalence of overweight and obesity in school-aged children is estimated  
62 to be ten per cent worldwide and increasing<sup>(1)</sup>. Obesity is recognized as a rapidly  
63 growing threat to the health of populations in an increasing number of countries around  
64 the world<sup>(2)</sup>, placing significant burden on healthcare systems. Prevention is recognized  
65 as the most realistic and cost effective strategy to deal with childhood obesity<sup>(3)</sup>.

66 While positive energy balance leads to the accumulation of excess weight, the  
67 aetiology of obesity is complex and dependent on more than just biology. For example,  
68 increased energy intake and/ or decreased energy expenditure is commonly entwined  
69 with environmental factors, across multiple settings<sup>(4)</sup>.

70 There has been a call for community-based obesity interventions as a strategy  
71 for prevention of childhood obesity<sup>(2)</sup>. Community-based interventions recognize the  
72 depth of community understanding held by members and their knowledge of  
73 community resources and dynamics<sup>(5)</sup>. These provide the foundation when designing  
74 and delivering interventions, including choice of settings and strategies. Furthermore,  
75 individual behaviours are only sustained if they are carried out in an environment that  
76 supports healthy choices<sup>(5)</sup>. In the case of obesity, this means that individual behaviours  
77 associated with excess weight gain (including healthy eating and physical activity) must  
78 be addressed in the context of the environment and the societal and cultural factors  
79 relevant to the individual<sup>(6)</sup>.

80 Despite the recognition that multi-setting, multi-strategy community-based  
81 action should be the foundation of obesity prevention efforts<sup>(7)</sup>, there are few published  
82 examples of such interventions<sup>(5)</sup>. The majority of childhood obesity prevention  
83 interventions are based in single settings, predominantly schools<sup>(8)</sup>. Therefore, there is a  
84 clear need to develop an evidence base of effective community-based obesity  
85 prevention interventions. Historically insufficient priority has been placed on  
86 appropriate evaluation designs or insufficient funding provided to allow rigorous  
87 evaluation<sup>(9)</sup>. Further evaluation of community-based interventions is hindered by the  
88 complexity of communities<sup>(9)</sup>, the inability to reproduce controlled environments often  
89 used in medical based research and the lack of setting-specific tools appropriate to  
90 specific target groups that measure the outcome, process and impact of interventions.

91           The *eat well be active (ewba)* Community Programs in South Australia (SA) are  
92 community-based childhood obesity prevention interventions which address  
93 environmental and individual barriers to behaviour change through a portfolio of  
94 strategies in a range of settings (Figure 1). The Programs are funded by SA Health  
95 (government) for five years in response to the rising levels of childhood overweight and  
96 obesity and the need to obtain evidence of the effectiveness of community-based  
97 obesity prevention. The Programs aim to promote healthy weight in children and young  
98 people aged 0-18 years, and their families, through increasing healthy eating and  
99 physical activity behaviours. The *ewba* Community Programs have a rigorous  
100 evaluation framework that will contribute to the evidence regarding best practice for  
101 community-based childhood obesity prevention programs. This framework includes  
102 quantitative and qualitative evaluation of process, impact and outcome elements and has  
103 a large scope across multiple population groups. The framework was designed to reflect  
104 the *ewba* interventions that were developed from a combination of best available  
105 evidence and extensive community consultation.

106           This paper focuses on the rationale, development and implementation of the  
107 baseline data collection in schools, a major component of the quantitative evaluation of  
108 the *ewba* Community Programs. It identifies a number of challenges experienced during  
109 this process and suggests some solutions.

110

## 111 **Methods**

### 112 **Rationale**

#### 113 ***Structure of the ewba Evaluation Academic Team***

114           The *ewba* Evaluation Academic Team has two internal members; the *ewba*  
115 Evaluation Coordinator (responsible for coordinating and compiling data collection and  
116 evaluation processes) and the *ewba* Manager who oversees this process; and three  
117 external academics who advise the team in nutrition, physical activity, childhood  
118 obesity and community development. Additional research staff (for example a PhD  
119 Candidate) are also members of this team. The internal members of the Evaluation  
120 Academic Team work closely with the Project Coordinators who implement the project;  
121 however these Project Coordinators are not part of the Evaluation Team.

122 ***Selection of intervention and comparison sites***

123 The intervention including the metropolitan suburb of Morphett Vale in southern  
124 Adelaide and the Rural City of Murray Bridge were selected by SA Health and the  
125 community health services implementing the projects, in consultation with community  
126 stakeholders, based on their high levels of disadvantage and the presence of existing  
127 infrastructure and experience necessary to support the Programs<sup>(10)</sup>. Two comparison  
128 communities (metropolitan suburbs of the Sea and Vines Department of Education and  
129 Children's Services (DECS) district and the Port Pirie Regional Council Area) were  
130 selected to match the sociodemographic profiles of the intervention sites as closely as  
131 possible, including: number and age distribution of children, socioeconomic status  
132 (SES) as measured by the Index of Relative Social Disadvantage (IRSD), educational  
133 levels, occupational and income distributions, family sizes, ethnic mix and rural-urban  
134 mix<sup>(10)</sup>. The IRSD provides an indication of socio-economic disadvantage by ranking  
135 different geographic areas of Australia according to a 'score' that is created for the area  
136 based on characteristics of people, families and dwellings within that area<sup>(11)</sup>.

137 ***Selection of samples for evaluation***

138 Middle and upper primary school children in school years five to seven (10-12  
139 year olds) were chosen as one litmus group for evaluation because (a) there is a  
140 significant dose of *ewba* intervention delivered through the school setting, (b) middle  
141 and upper primary school children are cognitively able to complete simple written  
142 questionnaires and self-report dietary<sup>(12)</sup> and physical activity habits<sup>(13)</sup> and (c) the  
143 primary school curriculum is reasonably able to accommodate the time required for data  
144 collection. School students, their parents, school principals, teachers, canteen and out of  
145 school hours care (OSHC) managers at intervention and comparison schools were  
146 invited to participate in the evaluation.

147 ***Selection of anthropometric outcomes for measurement***

148 Outcomes were chosen in consultation with the *ewba* Evaluation Team. Height  
149 and weight were measured and body mass index (BMI) calculated. Waist circumference  
150 was taken as a surrogate measure of central abdominal adiposity based on the following  
151 rationale. First, waist circumference is an indirect measure of central adiposity which is  
152 strongly correlated with risk for cardiovascular disease in adults<sup>(14)</sup> and an adverse lipid

153 profile and hyperinsulinaemia in children<sup>(15)</sup>. Second, children's waist circumference  
154 correlates well with CT scan as a measure of subcutaneous abdominal adipose tissue ( $r$   
155 = 0.93), and fairly well with intra-abdominal adipose tissue ( $r = 0.84$ )<sup>(16)</sup>. Third, waist  
156 circumference is easy to measure with simple, low-cost equipment, has low observer  
157 error, offers good reliability, validity and low measurement error<sup>(17)</sup> and has been used  
158 as a measure of child central adiposity in similar obesity prevention projects in  
159 Australia<sup>(18)</sup>.

### 160 ***Development of tools for quantitative ewba evaluation***

161 The key messages and objectives of *ewba* (Figure 1) informed the selection of  
162 the nutrition and physical activity outcomes to be measured. These outcomes included  
163 behaviours and also attitudes, knowledge and environments which influence these  
164 behaviours. It was acknowledged that traditional methods of dietary and physical  
165 activity assessment (for example diet diaries and accelerometers) do not provide insight  
166 into attitudes, knowledge and environments but such information is invaluable to  
167 understanding the obesity epidemic.

168 Due to the lack of tools in the published literature that addressed both the  
169 breadth of enquiry of *ewba* (Figure 1) and the specific project goals, more contemporary  
170 evaluation questions and methods that encompassed these factors were specifically  
171 developed through consultation and review. Several unpublished questionnaires not yet  
172 tested for validity or reliability from similar interstate projects helped inform the content  
173 of these questionnaires. Self-report questionnaires were chosen based on cost and time  
174 effectiveness, lower respondent burden and the age range of the sample (10-12 years)  
175 being appropriate for self-reporting of dietary and physical activity behaviours<sup>(12, 13)</sup>.

176 The seven questionnaires (Table 1) measure the obesogenicity of one or more of  
177 the home, school and community environments. This enables triangulation of data to  
178 test for agreement between reports (e.g. student and parent report). Four types of  
179 environments were investigated in all settings – political, physical, financial and socio-  
180 cultural<sup>(19)</sup>.

181 All seven questionnaires were piloted with small convenience samples of the  
182 relevant groups, in areas external to the *ewba* sites, prior to their use. The child nutrition  
183 questionnaire has been shown to be valid and reliable<sup>(20)</sup> and can be accessed from

184 <http://www.ijbnpa.org/content/5/1/5>. The child physical activity, teacher and parent  
185 questionnaires are currently being assessed for validity and reliability

## 186 **Implementation**

### 187 *Selecting and contacting schools*

188 The process and timelines for contacting schools regarding participation in the *ewba*  
189 intervention and collection of baseline data are outlined in Figure 2.

190 All government, catholic and independent primary schools in the intervention  
191 sites were invited to participate in the *ewba* intervention and evaluation. Those in  
192 comparison sites were invited to participate in the evaluation only. Schools in the  
193 intervention sites were offered the portfolio of *ewba* strategies that promoted healthy  
194 eating and physical activity and individually chose which strategies they each  
195 implemented throughout the intervention period. As a benefit of participation in data  
196 collection, both intervention and comparison schools were provided with aggregate  
197 information from all participating schools on students' nutrition, physical activity and  
198 standardized BMI, and summarized policy and practice patterns.

### 199 *Staff training*

200 A team of 14 staff were recruited and trained to collect the baseline data (Figure  
201 2). All staff attended a one-day training session run by the *ewba* Evaluation Academic  
202 Team. This included training in body image sensitivity<sup>(21)</sup>, measurement of weight,  
203 height and waist circumference, and description and practical run-through of the student  
204 questionnaires.

205 Staff were also trained to use three other resources including a standard  
206 preamble to introduce the data collection process and to provide instruction on  
207 completion of the student questionnaires, a poster depicting serve sizes of fruit and  
208 vegetables to assist students with portion size estimation in the nutrition questionnaire,  
209 and a series of visual aids to assist students distinguish between organized and non-  
210 organized activities in the physical activity questionnaire.

### 211 *Obtaining parental consent and child assent*

212 All year five, six and seven students in participating schools were invited to  
213 participate in data collection and consent forms were sent to participating schools to  
214 distribute to parents (Figure 2). Sample size calculations indicated that a response rate



215 of 60% would enable a 20% change in prevalence of a range of nutrition and physical  
216 activity behaviours to be detected with 80% power and alpha 0.05. Students returned  
217 consent forms with parental consent and child assent to their teachers and these were  
218 collected on the day of data collection. Students could consent to and participate in  
219 questionnaires but not anthropometric measures and vice versa, and they could  
220 withdraw from participation at any time. Verbal parental consent was accepted over the  
221 telephone on the day of measurement, provided the completed consent form was  
222 returned to *ewba* at a later date. Due to a low return rate of consent forms in the first 11  
223 schools measured in School Term 3, all students returning a consent form (regardless of  
224 their consent to the measures) in the subsequent 28 schools measured in School Term 4  
225 were offered a small gift (a hacky sack), provided the school gave permission.

#### 226 ***Baseline data collection***

227 The process of baseline data collection is outlined in Figure 3.

#### 228 *Questionnaires*

229 Prior to distribution of the questionnaires, the Measurement Team Leader read  
230 out the standard preamble to the whole student group. To avoid any systematic bias  
231 resulting from good student concentration during completion of the first survey and  
232 poorer concentration during completion of the second, the order in which the  
233 questionnaires were administered was varied between classes. Consequently, this effect  
234 (if present) was distributed across the two surveys. Students completed the  
235 questionnaires independently with the exception of two more complex questions in each  
236 questionnaire. These were led by the team leader with the whole student group, as  
237 piloting identified that students required extra assistance with these questions<sup>(20)</sup>. Staff  
238 referred to posters depicting fruit and vegetable serve sizes, and organized and non-  
239 organized activities, when necessary.

#### 240 *Anthropometric measurements*

241 The decision to take anthropometric measurements from children was carefully  
242 considered by the *ewba* Management Committee and Evaluation Team. In addition,  
243 informal consultation conducted with local stakeholder groups indicated majority  
244 support for the measurements to be taken whilst keeping in mind body image concerns.

245 A station for anthropometric measurements was set up with a set of scales  
246 (Tanita, Model HD332, China), stadiometer (Wedderburn, Model PE087, Australia and  
247 Germany) and tape measure for waist measurements (Lufkin, Model W606PM). In the  
248 larger schools and when there was sufficient measurement staff, two stations were set  
249 up. If a separate room was not provided for anthropometric measures, the equipment  
250 was set up behind a screen in the same room as questionnaires were administered. In  
251 this case, students were out of view of other students when measured, but could still be  
252 in view of the observing teacher. One male and one female staff member were present  
253 to take measurements. Particular steps were taken to minimize body image concerns,  
254 based on the work of Gibbs et al<sup>(21)</sup> (Table 2).

255 Students' names were called out and they were withdrawn temporarily from  
256 completing the questionnaires. Height, weight and waist circumference were measured  
257 without shoes using the protocols recommended by the International Society for the  
258 Advancement of Kinanthropometry<sup>(22)</sup>. Waist circumference was measured at the level  
259 of the visible narrowing of the waist and at end-tidal expiration<sup>(10)</sup>. All measurements  
260 were taken twice; a third was taken if the difference between the two measurements was  
261 too great (height: >5mm; waist: if the difference exceeded two percent of the lower of  
262 the 2 scores, weight: if there was a one percent (or greater) difference between the first  
263 and second readings)<sup>(22)</sup>. The mean of two and median of three measures were taken as  
264 the final score. All measurements were recorded on a standard record sheet. Inter-tester  
265 technical error of measurement (TEM) and inter-tester TEM were calculated for five of  
266 the measurers and shown to be well within acceptable ISAK standards<sup>(10, 22)</sup>.

### 267 ***Distribution of other questionnaires***

#### 268 *Parent*

269 On the consent form for child measurements, parents were asked to indicate if  
270 they were happy to complete a parent survey and if so to provide their home address.  
271 Questionnaires were sent by *ewba* home to parents who returned them directly to *ewba*  
272 via reply paid envelopes. Parents who returned a completed questionnaire went into the  
273 draw to win one of twenty A\$25 shopping vouchers.

#### 274 *School*

275 Teacher, principal, OSHC and canteen manager questionnaires were sent to the  
276 schools prior to data collection (Figure 2). Ideally, the completed questionnaires were  
277 collected on the measurement day (Figure 3) and if they had not been completed, extra  
278 copies were provided with a request to return to *ewba* as soon as possible. The five  
279 schools with the highest return rate of teacher and student questionnaires were offered  
280 an A\$100 voucher for sports equipment, a water cooler or fruit and vegetables.

### 281 ***Data entry and analysis***

282 As cost prohibited all data to be entered twice and checked for agreement  
283 (double data entry), a random sample of ten percent of child nutrition, physical activity,  
284 teacher and parent questionnaires were checked by the *ewba* team. The scoring system  
285 used to assess validity and reliability of the child nutrition questionnaire<sup>(20)</sup> was used to  
286 analyze the data from this questionnaire, and a similar scoring system was developed  
287 for the physical activity questionnaire. Target scores were developed for the nutrition<sup>(20)</sup>  
288 and physical activity questionnaires and these were used to report meaningful frequency  
289 data at baseline. Frequency data on responses from parent, teacher, principal, canteen  
290 and OSHC questionnaires were also reported. SPSS version 12.0.1 was used to analyze  
291 data.

### 292 ***Ethics approvals***

293 Ethics approval was granted from the SA Health Human Research, the  
294 Department of Education and Children's Services and the South Australian Aboriginal  
295 Health Research Ethics Committees.

296

## 297 **Results**

### 298 ***Consent and response rates***

299 Of the 44 primary schools in intervention and comparison sites, 39 agreed to participate  
300 (89% acceptance rate)<sup>(10)</sup>. The five schools that declined to participate were in  
301 comparison sites.

302 Table 3 shows response, consent and completion rates for the student  
303 questionnaires and anthropometry; and parent, teacher, principal, OSHC and canteen  
304 questionnaires. For students, consent rate is different from completion rate due to

305 absences on the day of survey. The number of students returning a consent form where  
306 either the student or parent did not assent/ consent to either questionnaires and/ or  
307 measurement was 262. One hundred and ten students who had consented were absent  
308 on the day of survey. Twenty three parents provided verbal consent on the day of  
309 survey. Table 4 shows the difference in overall response, consent and completion rates  
310 in the schools that received a gift for return of surveys (28 schools) compared with  
311 those who did not (11 schools). Response rates were significantly higher in schools  
312 receiving the gift ( $p<0.001$ ), and so were consent and completion rates ( $p<0.05$ ). One  
313 school chose not to take up the option of the gift.

#### 314 ***Data entry***

315 Ten percent of the child nutrition, child physical activity and teacher questionnaires  
316 were checked for data entry errors (173, 173 and 29 questionnaires respectively). The  
317 error rates (expressed as number of items with an error per total number of items in one  
318 questionnaire) were found to be 0.3 %, 0.5 % and 0.17 % respectively. Twelve percent  
319 of parent questionnaires were checked (121 questionnaires). The error rate was found to  
320 be 0.69 % with three questions regarding higher errors than any others. Exclusion of  
321 these three questions reduced the error value to 0.48 %. These three questions were  
322 checked in all 983 questionnaires. The entire anthropometry data file was checked for  
323 errors and amended accordingly. Eleven students were excluded due to incomplete or  
324 missing data.

325

## 326 **Discussion**

327 This paper describes the rationale, development and implementation of the quantitative  
328 baseline data collection in schools which is one component of the evaluation of the  
329 *ewba* Community Programs. It focuses on the questionnaires and anthropometric  
330 measures taken in 10 to 12 year old school students. This discussion will demonstrate  
331 the numerous logistical, practical and methodological challenges met during the data  
332 collection process, and will also consider solutions to these challenges, which provide  
333 learnings for other researchers involved in evaluation of similar programs. To avoid

334 biasing the results of the *ewba* evaluation, such adaptations will not be introduced in  
335 this study at post-intervention data collection.

336         There were large variations between schools in terms of daily timetable, class  
337 structure and school dynamics, and it was necessary to ensure that data collection  
338 slotted into the schools' schedules as seamlessly as possible. Similar projects should  
339 obtain school schedules as early as possible and ensure their data collection process is  
340 flexible enough to fit in with differing school schedules.

341         Similarly, to ensure maximum return of consent rates and hence sample size,  
342 consent forms were not collected by *ewba* until the day of survey. Hence decisions that  
343 were based on the number of children consenting could not be made until the day of  
344 survey. For example, if consents were low, it was less disruptive to combine students  
345 from multiple classes with consent in a separate space to complete questionnaires, while  
346 when consents were high, it was more practical to visit each class separately and  
347 students without consent were kept busy with another task. It is important that  
348 researchers in similar studies allow enough time and flexibility in their schedule to  
349 allow such options.

350         Data collection was performed late in school term three and early in term four  
351 (September to November) 2006. Term four is recognized as a busy time for schools and  
352 this could have had an impact on their response to data collection. If possible  
353 researchers should avoid data collection in term four, particularly towards the end.  
354 However, the short period over which data were collected was ideal as it limited any  
355 seasonal changes in nutrition and physical activity behaviours that were independent of  
356 the program.

357         The ability of teachers to control student behaviour varied and in some cases  
358 *ewba* staff were required to assist with behaviour management, making it more difficult  
359 to complete other tasks. Some students had very low literacy levels and often required a  
360 staff member to guide them through the questionnaires. This was resource intensive and  
361 left fewer staff to assist the remainder of the class with queries. In the early stages of  
362 data collection, it became apparent that students in year five generally required more  
363 assistance to complete questionnaires than those in years six or seven. Consequently,  
364 larger teams (four to five people) were allocated to attend classes with year five

365 students. It is important that researchers in similar studies assess whether behavior  
366 management and literacy problems are likely to be an issue and if so, provide sufficient  
367 staff members to handle such situations effectively.

368         Designation of a suitable space for data collection by the school often proved  
369 problematic. In particular, anthropometric measures had to be taken in an area that was  
370 not secluded, but private enough for children to feel comfortable and not vulnerable. It  
371 is important that schools receive clear guidelines about the types of spaces that are and  
372 are not appropriate for such measurements. In case a suitable space is not available, the  
373 research team needs to be prepared with a back-up, such as a screen that can be used as  
374 a privacy shield.

375         It is important to allow sufficient time between recruitment of measurement staff  
376 and schools and the commencement of measures (Figure 2). In terms of measurement  
377 staff, sufficient time ensures detailed training around the questionnaires, in particular  
378 how to respond to specific student queries, ensuring consistent responses across team  
379 members. However, an in-depth understanding of the types of questions asked by  
380 students only develops over time by undertaking the data collection process. This  
381 highlights the importance of extensively piloting questionnaires where possible. In the  
382 case of time between recruitment of schools and measures, in some cases, there was  
383 only six to eight weeks between the first letter schools received from *ewba* and data  
384 collection (Figure 2). This may explain why the target completion rate of 60 percent  
385 was not reached. If possible similar studies should allow more time between first  
386 contacting schools and data collection. This would allow greater flexibility with dates  
387 and times, provide opportunity for project staff to visit schools and identify suitable  
388 spaces for data collection, allow reminders/ extra consent forms to be sent home and  
389 more time to collect information from schools including number of teachers, students  
390 and classes. Consent forms could also be collected prior to data collection, with  
391 additional consenters allowed on the day. However, such methods would require extra  
392 visits to the school which would be more resource and time intensive.

393         The consent rates of students in this study were similar to those in other studies.  
394 For example, 46% of ten-year olds in intervention and control schools consented to  
395 baseline measures in the Energize project<sup>(23)</sup>. Forty four percent of primary school

396 children in control sites and 58% in intervention sites consented to measures in the Be  
397 Active Eat Well intervention<sup>(18)</sup>.

398 The body image protocol, standard preamble and use of the small gift for  
399 students returning consent forms all worked well during the baseline quantitative  
400 measures for *ewba*. These may also be beneficial strategies for similar studies. No  
401 specific issues around body image were raised, suggesting that the body image protocol  
402 was successful in this regard. The standard preamble was an effective introduction to  
403 the measuring team and questionnaires; no questions were consistently asked by  
404 students that indicated a lack of understanding of a certain question or instruction that  
405 should have been covered in the standard preamble. The use of the small gift for  
406 students returning consent forms (regardless of their consent to the measures) resulted  
407 in a significantly higher response, consent and completion rate.

408

## 409 **Conclusion**

410 This paper describes the rationale, development and implementation of one of  
411 the baseline quantitative data collection process as part of evaluation of a multi-setting,  
412 multi-strategy, community based childhood obesity prevention program. It demonstrates  
413 the complexity of developing a quantitative evaluation process in schools for a multi-  
414 strategy and multi-setting project, discusses some of the challenges associated with the  
415 data collection process and poses some solutions that may be considered by other  
416 similar projects. The experience of baseline data collection for the *eat well be active*  
417 Community Programs has provided a clearer understanding of the processes and  
418 potential difficulties involved with planning and implementing this type of evaluation.

419 Similar programs can use (a) the quantitative evaluation of the *ewba* Community  
420 Programs as an example of one part of a rigorous evaluation for a community-based  
421 intervention to inform their own quantitative data collection and (b) the challenges and  
422 potential solutions reported in this paper as a form of practical advice to assist with  
423 planning and implementing quantitative evaluation of similar, multi-setting, multi-  
424 strategy programs.

425

426

427 **Tables**

428

429 **Table 1: The seven program-specific *eat well be active* questionnaires for**  
 430 **evaluation purposes in intervention and comparison sites**

Questionnaire	Completed by whom	Number of items	Key measures
Nutrition	Students in schools years 5-7 (age 10-12 years)	12	<ul style="list-style-type: none"> <li>• Child behaviours, attitudes and knowledge associated with healthy eating (HE)</li> <li>• Obesogenicity of home, school &amp; community environments*</li> </ul>
Physical activity	Students in schools years 5-7 (age 10-12 years)	16	<ul style="list-style-type: none"> <li>• Child behaviours, attitudes and knowledge associated with physical activity (PA)</li> <li>• Obesogenicity of home, school &amp; community environments*</li> </ul>
Parent	Parents of students in school years 5-7	27	<ul style="list-style-type: none"> <li>• Demographics</li> <li>• Obesogenicity of home environments*</li> <li>• Parental knowledge &amp; attitudes towards HE &amp; PA</li> <li>• Child PA &amp; HE behaviours</li> </ul>
Teacher	Primary school teachers	15	<ul style="list-style-type: none"> <li>• Teaching practices around HE &amp; PA &amp; inclusion in school curriculum</li> <li>• Training/ experience in HE &amp; PA</li> <li>• Teacher knowledge &amp; attitudes towards HE &amp; PA</li> </ul>
Principal	Principals	27	<ul style="list-style-type: none"> <li>• School HE &amp; PA environments*</li> <li>• Links with parents/ other</li> </ul>



			organizations around HE & PA
Canteen†	Canteen Manager	16	<ul style="list-style-type: none"> <li>• Canteen operational details</li> <li>• Factors affecting food sold</li> <li>• Food sold by canteen, including healthier products</li> </ul>
Out of School Hours Care† (OSHC)	OSHC Manager	20	<ul style="list-style-type: none"> <li>• OSHC HE &amp; PA environments*</li> <li>• OSHC Manager knowledge and attitudes towards HE &amp; PA</li> </ul>

431 \*Physical, political, socio-cultural and financial environments<sup>(18)</sup>

432 †Not all schools have these facilities

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462 **Table 2: Body Image Protocol used in the *eat well be active* Community**  
463 **Programs<sup>(20)</sup>**

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#### **Elements of the *ewba* Body Image Protocol**

- Parent consent and child assent required for child participation
- Information accompanying consent form explained the population approach of *ewba* and thus focus was on group not individual results – hence individual results not released
- Measurement staff trained in body image sensitivity by an external expert to ensure consistency of language and reduce transfer of negative messages about weight
- Police criminal record check for all measurement staff
- Measurements conducted out of view of other students and results screened from participants to reduce opportunities for comparison
- Children asked only to remove shoes and any heavy weight jumpers/ jackets
- Waist measurements taken over the child’s shirt
- Participants able to choose whether measurements taken by a male or female staff member
- School teacher to be present at all times during data collection and measurements

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471 **Table 3: Rates of return for the student, principal, Out of School Hours Care**  
 472 **(OSHC), canteen, parent and teacher questionnaires and student participation in**  
 473 **the anthropometric measurements for baseline data collection of the *ewba***  
 474 **Community Programs**

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Questionnaire/ measurements	N Eligible	Response (%)†	Consent (%)‡	Completed§ (%)
Student nutrition	3647	2104 (57.7)	1842 (50.5)	1732 (47.5)
Student PA	3647	2104 (57.7)	1842 (50.5)	1732 (47.5)
Student anthropometric measurements	3647	2009 (55.0)	1747 (47.9)	1626 (44.8)
Parent	1519	*	*	983 (65)
Teacher	667	*	*	286 (43)
Principal	40	*	*	36 (90)
OSHC	19	*	*	13 (68)
Canteen	29	*	*	26 (90)

476 \*Not applicable: completion of questionnaire taken as consent – no extra consent form  
 477 required

478 †Returned a consent form, regardless of whether consented to questionnaires and/ or  
 479 anthropometric measures (could return a form and not consent)

480 ‡Returned a consent form and consented to questionnaires and/ or anthropometric  
 481 measures

482 § Questionnaires were completed and/ or anthropometric measures were taken on the  
 483 day of survey

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491 **Table 4: Completion, consent and response rates to surveys and anthropometric**  
 492 **measures by students receiving a small gift for return of consent form compared**  
 493 **with those not receiving a gift**

	Schools with students receiving gift (%)	Schools with students not receiving gift (%)
Completion rate	48.6*	43.1
Consent rate	51.6*	46.3
Response rate	60.9**	51.5

494 \*p<0.05

495 \*\*p<0.001

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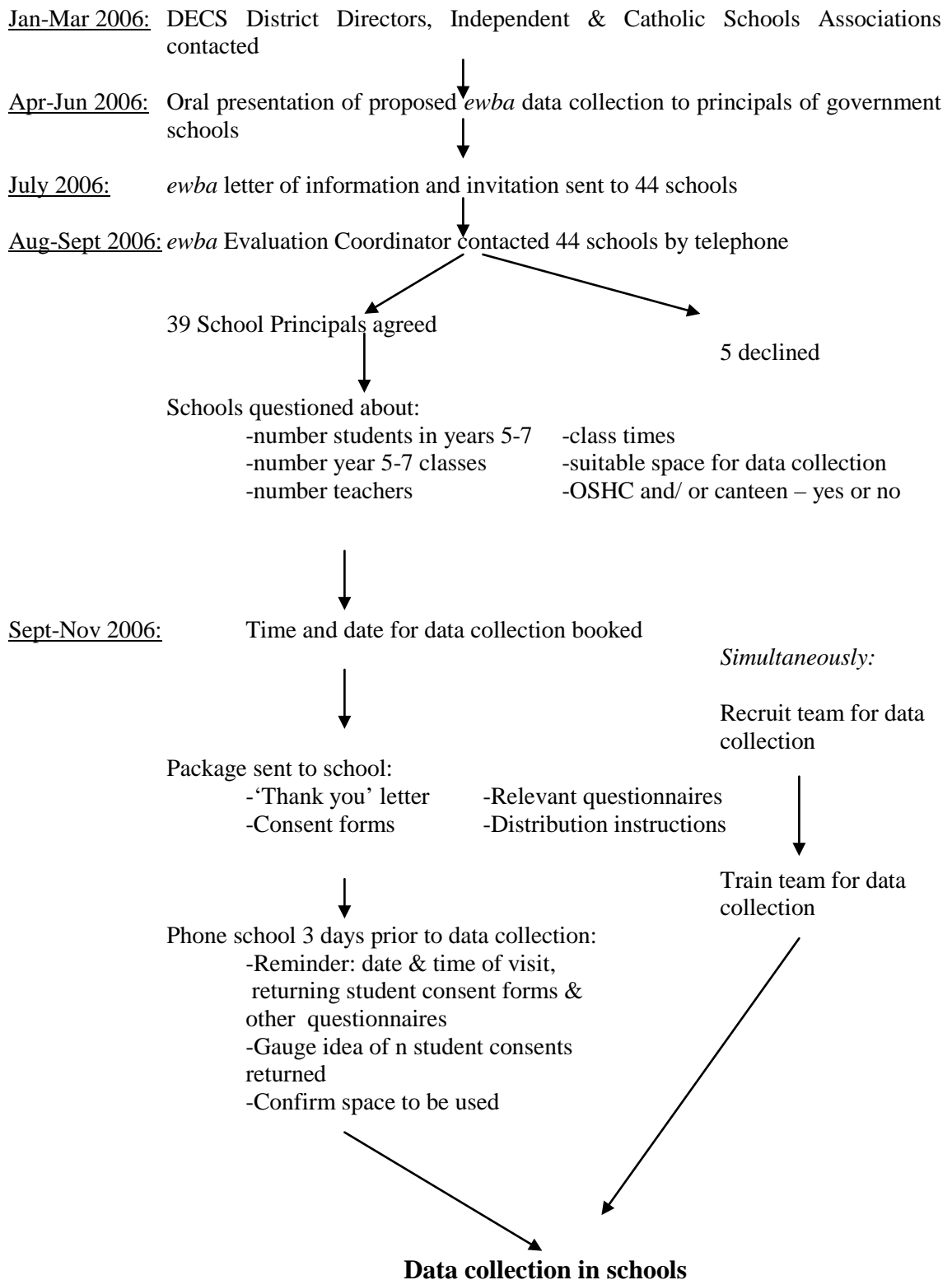
497 **Figures**

498 **Figure 1: Key messages, strategies and settings of the *eat well be active* Community**  
 499 **Programs**

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**Figure 2: Process used for contacting schools about the ewba intervention and baseline data collection**



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**Figure 3: Process of ewba baseline data collection in schools**

Team (2-3 staff) arrived at school 30 minutes prior to start of measurement session



Provision of room/ rooms for data collection [see options (a) and (b) below]



Set-up:

- posters
- anthropometric measuring equipment (behind screen if no separate room provided)



Option (a): Students with parental consent and child assent removed from classroom and taken to separate room

**OR**

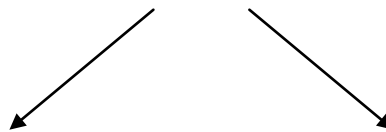
Option (b): All students remain in classroom and only those with consent given questionnaire



Collect consent forms & read standard preamble



*Simultaneously:*



Students complete questionnaire 1

-Students with consent removed for anthropometric measurements



Students complete Questionnaire 2



-Students return to complete questionnaire



Collect questionnaires & thank students

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691

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