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Cohort Profile: The Resilience for Eating and Activity Despite Inequality (READI) study

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Cohort Profile: The Resilience for Eating and Activity Despite Inequality (READI) study

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Summary

The Resilience for Eating and Activity despite Inequality (READI) cohort was established to address two key aims: to investigate the pathways (personal, social and structural) by which socioeconomic disadvantage influences lifestyle choices associated with obesity risk (physical inactivity; poor dietary choices); and to explore mechanisms underlying 'resilience' to obesity risk in socioeconomically disadvantaged women and children. A total of 4349 women aged 18-46 years, and 685 children aged 5-12 years, were recruited from 80 socioeconomically disadvantaged urban and rural neighbourhoods of Victoria, Australia, and provided baseline (T1: 2007-8) measures of adiposity, physical activity, sedentary and dietary behaviours; socioeconomic and demographic factors; and psychological, social, and perceived environmental factors that might impact obesity risk. Audits of the 80 neighbourhoods were undertaken at baseline to provide objective neighbourhood environmental data. Three-year follow-up data (2010-11) have recently been collected from 1912 women and 382 children. Investigators welcome enquiries regarding data access and collaboration.

MESH Headings: obesity, social class, women, child

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60**Key Messages**

- A proportion of women and children living in socioeconomically disadvantaged neighbourhoods manage to engage in health-promoting physical activity and eating behaviours and to maintain a healthy weight, despite their disadvantaged circumstances
- Selected intrapersonal (e.g., priority given to diet and physical activity, outcome expectancies, self-efficacy, behavioural skills,) and social (e.g. social support from family) characteristics appeared associated with resilience to obesity and obesity-promoting behaviours
- Despite frequent contacts, compensations, and intensive tracking, it is challenging to maintain a cohort of women and children living in disadvantaged

Why was the cohort set up?

The global obesity pandemic has triggered calls for urgent action to halt rising rates of obesity worldwide^{1,2}. Currently, however, preventive strategies are hindered by a lack of evidence about the most important determinants of population increases in obesity. In developed countries, obesity rates are disproportionately higher amongst persons experiencing socioeconomic disadvantage i.e. those with low education levels, low incomes, or unemployed/in low status occupations^{3,4}. Further, accumulating evidence demonstrates that living in a disadvantaged neighbourhood confers increased risk of becoming obese, independent of individual-level socioeconomic position^{5,6}. Lack of physical activity, excessive sedentary behaviour and poor diet are also disproportionately experienced by those who

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3 are socioeconomically disadvantaged⁷⁻⁹. However, the mechanisms underlying these
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5 inequalities are poorly understood.
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10 Unhealthy weight gain may also be more problematic amongst certain demographic groups.
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12 Two groups experiencing increasing risk of obesity are children, and women of childbearing
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14 age (approximately 18-45 years)^{10,11}. Childhood and the childbearing years may also be
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16 times when interventions have the potential for making a more lasting impact on obesity
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18 risk.
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24 In recognition of the need to build an evidence base to inform obesity prevention initiatives,
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26 particularly in high-risk groups, we applied for and were awarded funds under a 'Strategic
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28 Award' of the Australian National Health and Medical Research Council. Strategic Awards
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30 are aimed at supporting health and medical research in areas identified as key priorities. The
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32 funds were allocated to the Centre for Physical Activity and Nutrition Research, Deakin
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34 University, Australia, to support a five-year program of research entitled 'Resilience for
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36 Eating and Activity Despite Inequality' (READI).
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43 The READI program involved the establishment of a cohort of women (aged 18-46 years)
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45 and children (5-12 years) living in socioeconomically disadvantaged urban and rural
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47 neighbourhoods located in the state of Victoria, Australia. Other aspects of the READI
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49 program include qualitative sub-studies with targeted cohort participants; qualitative and
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51 quantitative sub-studies of obesity-related policies and programs within the READI cohort
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53 neighbourhoods; quantitative investigations of determinants of active commuting amongst
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55 children; and feasibility and effectiveness testing of obesity-prevention initiatives in
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3 socioeconomically disadvantaged neighbourhoods that were informed by the findings from
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5 the READI cohort study and related sub-studies.
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10 The aims of the READI study are to:

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12 1. Investigate pathways (personal, social and structural) by which socioeconomic
13 disadvantage influences lifestyle choices associated with obesity risk (physical inactivity;
14 poor dietary choices);
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16 2. Explore mechanisms underlying ‘resilience’ to obesity risk in socioeconomically
17 disadvantaged women and children.
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27 Typically, epidemiological studies investigating the drivers of obesity have focused primarily
28 on establishing the predictors of risk of obesity or its determinant behaviours. However, as
29 we have argued previously^{12,13}, not everyone experiencing socioeconomic disadvantage is
30 overweight or obese, or gaining weight. An alternative, but less-utilised approach to
31 understanding the mechanisms underlying the increased rates of obesity amongst those
32 who are socioeconomically disadvantaged, involves investigation of the characteristics of
33 those who manage to engage in obesity-protective behaviours, and to maintain a healthy
34 weight. We have suggested that this may represent a form of ‘resilience’^{12,13}. Resilience is
35 defined as a “dynamic process encompassing positive adaptation within the context of
36 significant adversity”¹⁴. When applied to obesity, a ‘resilience’ approach would comprise
37 investigation of those characteristics and supports of individuals who manage to maintain a
38 healthy weight, or healthy weight-related behaviours (particular eating patterns and
39 physical activity), despite exposure to circumstances (such as socioeconomic disadvantage)
40 that generally increase obesity risk^{12,13}. This cohort study applies this approach.
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Who is in the cohort?

The baseline READI sample includes 4,349 women aged 18-46 years, and 685 children aged 5-12 years, who were selected as follows.

In 2007, using a classification of cities (urban), fringe and rural areas consistent with the Australian Regional Infrastructure Development Fund Act 1999 (Version No. 003), all urban and rural neighbourhoods (based on postal code, or suburb area boundaries) within the state of Victoria were identified. Briefly, urban areas include metropolitan Melbourne, rural cities (defined by the Act mentioned above) and all areas completely within a 10km radius of the centroid of these cities, as well as all areas completely within a 10km radius of the centroid of other Victorian cities with a population of more than 20,000. Rural areas were those falling outside of metropolitan Melbourne and outside a 25km radius of the rural cities. An area-level indicator of disadvantage developed by the Australian Bureau of Statistics in 2001¹⁵ was used to classify all neighbourhoods within urban/rural strata into thirds. This indicator is known as the Index of Relative Socioeconomic Disadvantage or SEIFA. Neighbourhoods in the bottom SEIFA third were considered 'disadvantaged'. Of these, neighbourhoods with fewer than 1200 residents and those located more than 200km from Melbourne for reasons of inadequate sample size or excessive logistical/financial cost were excluded. From the remaining sampling frame, 40 urban and 40 rural neighbourhoods were randomly selected. The sampled urban areas had an average geographic area of 7.3 (SD=7.4) km² and average population of 10,703 (SD=7,616) whilst these values were 95.1 (SD=74.1) km² and 4,450 (SD=3,196), respectively, among the sampled rural areas. The

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3 Australian electoral roll (registration on the electoral roll is compulsory for Australian
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5 citizens) was used to randomly identify 150 women aged 18-45 years from each of the 80
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7 areas. In three neighbourhoods with fewer than 150 eligible women, all women were
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9 selected, resulting in a total sampling pool of 11940 women.
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16 In late 2007 and early 2008, a pre-survey letter was mailed to advise of an impending
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18 survey, which was posted one week later. Of the total of 11940 surveys sent out, 861 (7.2%)
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20 were returned as undeliverable. A reminder protocol for the remainder was used based on
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22 the Dillman approach¹⁶. This involved a reminder letter sent 10 days after the survey, and a
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24 second and final reminder including a copy of all documentation and another copy of the
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26 survey 10 days after the first reminder. A total of 4938 completed surveys were received
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28 (45% of those delivered). Women who had moved from the sampled neighbourhood prior
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30 to completing the survey (n=571), completed the survey but were not an intended
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32 participant (n=3), withdrew their data after completing the survey (n=2), or were aged
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34 under 17 or over 46 years (n=13), were excluded, leaving 4349 (39% of those delivered a
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36 survey) eligible women with survey data at baseline (Figure 1). Home address is the only
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38 data available on sampled non-respondents. Non-respondents were more likely to reside in
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40 an urban than a rural area ($p<0.01$), and resided in areas with lower mean SEIFA scores
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42 (representing greater area-level disadvantage) compared with respondents ($p<0.01$; see
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44 Table 1). Comparison with the general population of women living in the 80
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46 neighbourhoods recorded in the 2006 Census^{17,18} showed that a greater proportion of
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48 READI women were Australian born (89% vs. 73%), and were married or living as married
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3 (65% vs. 49%), but a lower proportion of READI women were in full-time employment (37%
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5 vs. 58%).
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11 Of participating women, 1457 indicated that they had a child within the eligible age range
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13 (5-12 years) and 771 (53%) consented to that child being included in the study. Of these,
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15 613 completed a survey about their child, 634 had their children's height and weight data
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17 collected at their child's school or home, and 515 had their child wear an accelerometer to
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19 provide physical activity data (Figure 2).
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27 Table 1 about here
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32 **How often have they been followed up?**

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34 Of the full cohort, those who consented to further follow-up and remained eligible (n=3019
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36 women and 590 children) were recontacted to complete a follow-up survey three years
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38 after the baseline survey (Time 2; 2010-2011). Completed T2 surveys were provided by 1912
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40 women, of whom 382 also completed a child survey. Comparison on baseline characteristics
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42 of those who withdrew or were lost to follow-up with those who remained in the survey at
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44 T2 showed that women remaining in the T2 cohort were older, had a higher SEIFA suburb
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46 score (ie less disadvantage), and were more likely to have a high level of education, a high
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48 household income, be married, be working part-time, have children, be born in Australia,
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50 and live in a rural suburb, compared to the women who only participated at T1 (see Table
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56 2). Among children, the T2 cohort did not differ from the T1-only participants with regard to
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3 age or gender. However, children in the T2 cohort had lower BMI/BMI z-scores and a higher
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5 SEIFA score, and were more likely to have a mother with a high level of education,
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7 compared to the children who only participated at T1.
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15 Table 2 about here
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22 University funding has been committed to a further follow-up (T3; 2012-2013), and funding
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24 will be sought for future cohort follow-ups. In addition, targeted participants have been
25
26 invited to participate in sub-studies. For example, a sample of women and children whose
27
28 baseline data showed that they were in a healthy weight range (women), or had maintained
29
30 relatively healthy eating and physical activity behaviours (children), participated in
31
32 qualitative sub-studies aimed at identifying characteristics that had contributed to their
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34 'resilience'^{19,20}.
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41 Between follow-ups, we have implemented intensive tracking and cohort maintenance
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43 strategies in attempts to minimise attrition. Tracking protocols include attempting other
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45 forms of contact including telephone and email, following up any forwarding addresses,
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47 collecting details of and contacting alternative nominated contact persons, searches of
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49 telephone white pages, and contacting the school of the child (if applicable) in the study.
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51 Cohort maintenance strategies include small compensations and gifts included with and
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53 between surveys for women (lottery tickets, tea bags, kitchen tea-towel set) and children
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55 (sports bag); study newsletters, birthday and festive season cards posted annually. Shortly
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3 after completing the baseline survey, all participating women were posted a magnet
4 containing the research team's contact details and encouraging participants to inform the
5 team of any change of address. Responses to these strategies are encouraging. For example,
6 as at May 2012, research staff had received more than 431 contacts advising of a change of
7 address; and 85 contacts in response to gifts.
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14 15 16 17 **What has been measured?**

18 A range of personal, social, structural and policy factors may influence obesity risk.
19 However, little research has investigated multiple levels of influence related to obesity risk
20 simultaneously, particularly amongst socioeconomically disadvantaged target groups. This
21 study was designed to investigate the role of multiple domains of influence and the
22 mediation pathways on risk of obesity and its determinant behaviours.
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34 Key outcomes include body mass index, calculated from self-reported height and weight for
35 women and objectively-measured height and weight for children. Self-report has been
36 established as a valid means of assessing height and weight for estimating BMI amongst a
37 sample of mid-aged Australian women²¹. Survey data were collected on hypothesised
38 personal, social and perceived environmental predictors of body weight, as summarised in
39 Table 3. The development of survey items was guided by both social ecological theory²², as
40 well as by a theoretical framework focused on explaining socioeconomic variations in
41 behaviours adapted from work by Kamphuis et al²³. Women provided survey data for
42 themselves and, where applicable, for their participating child. Validated measures were
43 used where possible; all survey measures were pilot-tested and one-week test-retest
44 reliability was established with 72 women (women's survey) and 76 mothers (children's
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3 survey). Children also wore an Actigraph GT1M accelerometer (Actigraph, Pensacola,
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5 Florida, USA) for eight days. Accelerometers are accepted as a valid objective measure of
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7 children's physical activity^{24,25}. Children's height and weight were measured by trained
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9 research assistants.
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15 To investigate structural environmental determinants of obesity risk, objective audits of the
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17 80 study neighbourhoods were undertaken, and data were collected on a range of
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19 environmental attributes as shown in Table 3. Women's home addresses, and the locations
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21 of all of the environmental facilities investigated, were geocoded in a Geographic
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23 Information System (GIS) (ESRI, 2009 ArcGIS Version 9.3.1, ESRI, Redlands, California, USA
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25 2009), and the number of different facilities within neighbourhoods, as well as the proximity
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27 via the road network from participants' homes (and children's schools) to the various
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29 facilities, were calculated.
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39 Table 3 about here
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45 46 **What has it found? Key findings and publications** 47

48 Papers published to date include those reporting on characteristics cross-sectionally
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50 associated with resilience to physical inactivity and obesity amongst women^{26,27} and
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52 resilience to obesity amongst mothers^{28,29}. Qualitative follow-up studies with 'resilient'
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54 women and children identified in the cohort have generated further insights on
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56 characteristics associated with resilience to obesity and its determinant behaviours in these
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3 groups^{19,20}. Collectively, the findings to date suggest some factors that appear to
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5 characterise resilience to obesity and its determinant behaviours amongst women and
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7 children. For example, amongst mothers participating in the READI cohort, the ability to
8
9 prioritise time for healthy eating and physical activity were key intrapersonal factors
10
11 associated with mothers' own resilience to obesity; social support for healthy eating from
12
13 family was a key social factor²⁹ (see Table 4). Nutrition knowledge, self-efficacy, outcome
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15 expectancies and behavioural skills were key factors associated with healthy weight and its
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17 behavioural determinants amongst women in the cohort as a whole²⁷. Mothers' self-efficacy
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19 for promoting their children's physical activity, limited use of food as a reward and not
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21 placing a television set in children's bedrooms were key correlates of healthier weights
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23 amongst READI children³⁰. The comprehensive survey has also enabled investigation of
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25 more diverse issues, such as rural-urban differences in weight status amongst women and
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27 children (resulting in a paper³¹ cited in the 2010 Australian National Women's Health
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29 Policy); rural-urban differences in physical activity and its correlates amongst women³²;
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31 social norms and eating and activity behaviours³³; and associations of physical activity and
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33 sedentary behaviour with depression³⁴.
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45 Table 4 about here
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52 **What are the main strengths and weaknesses?**

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54 Strengths include the recruitment of a large sample of women and children from
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56 socioeconomically disadvantaged neighbourhoods, a population typically considered 'hard
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3 to reach'; the inclusion of rural women and children, an under-studied population; the
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5 recruitment of mothers and children from the same families, to enable an examination of
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7 shared familial environmental risk and protective factors for obesity; the inclusion of a
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9 broad range of potential determinants based on a theoretical framework; the focus on
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11 resilience to obesity, which is a novel approach to identifying potential intervention levers
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13 for those living in disadvantages circumstances; and good engagement/rapport – e.g. cards,
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15 contacts, communication. Other strengths are the use of objectively-assessed measures of
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17 height and weight and of physical activity amongst children; and objective environment/GIS
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19 data to supplement self-reported perceptions. Missing data were also minimal; all returned
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21 surveys were checked by research assistants on receipt and where missing data were
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23 identified, participants were first contacted via telephone, then by letter, in an attempt to
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25 gather these data. Missing data were not pursued for time-dependent (i.e. questions
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27 relating to the past week) or sensitive (i.e. income) questions. Consequently, variables with
28
29 a relatively high frequency of missing values for women at T1 included those for income and
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31 BMI, with each having only around 5% missing data. Initial investigations of missing data
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33 showed, for example, that the main outcome of interest (BMI) did not differ significantly
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35 between women who did and did not have missing income data.
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45 One of the main study weakness is the relatively low response rate and high attrition. The
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47 initial participation rate was not high (45%), but this is not unusual for this typically hard-to-
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49 reach population group. Despite intensive tracking and cohort maintenance strategies,
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51 some attrition occurred prior to the first follow-up (Figure 3 and 4), and those who
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53 remained in the cohort differed sociodemographically to those who were lost. Other
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55 weaknesses include the primary reliance on self-report data, although validated and reliable
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3 measures were used as much as possible. Although all participants reside in
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5 socioeconomically disadvantaged neighbourhoods – itself a risk factor for obesity – baseline
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7 data suggest that a substantial proportion of respondents would not be considered
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9 socioeconomically disadvantaged on the basis of individual-level socioeconomic
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11 characteristics (e.g., 26% had a tertiary education level). There is likely under-sampling of
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13 extremely disadvantaged women, such as those with low literacy or those who do not read
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15 or speak English well. In addition, because of the substantial neighbourhood environmental
16
17 data collection component, eligibility requirements included residing in one of the 80
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19 sampled neighbourhoods. Limiting the sample to those still residing in their sampled place
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21 of residence necessitated the exclusion of survey data from a substantial proportion (11%)
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23 of respondents who had moved subsequent to sampling, since the budget did not permit
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25 environmental data collection from neighbourhoods outside of those originally sampled.
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33 **Where can I get hold of the data? Where can I find out more?**

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35 The READI Chief Investigators welcome enquiries by researchers interested in discussing
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37 collaborations on the cohort data. Such proposals will be assessed for feasibility and overlap
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39 with existing work underway or planned. Please contact Professor Kylie Ball, email
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41 kylie.ball@deakin.edu.au, for further details.
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Table 1. Comparison of READI cohort participants and sampled non-respondents on measures of area of residence and area-level socioeconomic disadvantage (SEIFA) at baseline (T1)

	All sampled women (n=11940)		READI respondents (n=4349)		Non-respondents (n=7591)		p ^a
Area of residence, <i>n</i> (%)							<0.0005
Urban	5975	(50.0)	2016	(46.4)	3958	(52.1)	
Rural	5966	(50.0)	2333	(53.6)	3633	(47.9)	
SEIFA suburb disadvantage, <i>Mean (SD)</i>	941.7	(61.2)	948.3	(56.4)	938.0	(63.5)	<0.0005

^a Significance test of difference between baseline cohort and non-participants.

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Table 2. Comparison of T1 characteristics of women remaining in the cohort at T2 with those withdrawing/lost to follow-up

T1 characteristics	Baseline women cohort (n=4349)		T2 women cohort (n=1912)		T1-only women (n=2437)		p ^a
	M	(SD)	M	(SD)	M	(SD)	
BMI	26.1	(6.1)	26.2	(5.9)	26.0	(6.1)	0.304
Age	34.4	(8.1)	36.0	(7.7)	33.2	(8.3)	<0.0005
SEIFA suburb disadvantage	948.3	(56.4)	956.3	(49.4)	942.1	(60.5)	<0.0005
	n	(%)	n	(%)	n	(%)	
Education							0.004
Low (did not complete high school)	946	(22.1)	412	(21.7)	534	(22.4)	
Medium (completed high school or equivalent)	2216	(51.8)	945	(49.7)	1271	(53.4)	
High (completed tertiary education)	1120	(26.2)	544	(28.6)	576	(24.2)	
Household income							<0.0005
Low (\$0-699/week)	1117	(25.7)	437	(22.9)	680	(27.9)	
Medium (\$700-1499/week)	1522	(35.0)	755	(39.5)	767	(31.5)	
High (\$1500+/week)	762	(17.5)	397	(20.8)	365	(15.0)	
Not disclosed	948	(21.8)	323	(16.9)	625	(25.6)	
Marital status							<0.0005
Married/de facto	2829	(65.5)	1368	(71.6)	1461	(60.6)	
Separated/divorced/widowed	370	(8.6)	154	(8.1)	216	(9.0)	
Never married	1123	(26.0)	388	(20.3)	735	(30.5)	
Country of birth							<0.0005
Australia	3851	(88.9)	1766	(92.4)	334	(86.2)	
Other	480	(11.1)	146	(7.6)	2085	(13.8)	
Area of residence							<0.0005
Urban	2016	(46.4)	765	(40.0)	1251	(51.3)	
Rural	2333	(53.6)	1147	(60.0)	1186	(48.7)	
Employment status							<0.0005
Working full-time	1613	(38.1)	693	(36.9)	920	(39.1)	

T1 characteristics	Baseline women cohort (n=4349)		T2 women cohort (n=1912)		T1-only women (n=2437)		p ^a
Working part-time	1245	(29.4)	617	(32.8)	628	(26.7)	
Not currently employed in paid work	1372	(32.4)	570	(30.3)	802	(34.1)	
Number of children							<0.0005
None	1679	(39.4)	671	(35.5)	1008	(42.5)	
One	786	(18.4)	356	(18.8)	430	(18.1)	
Two	1087	(25.5)	515	(27.2)	572	(24.1)	
Three or more	713	(16.7)	349	(18.5)	364	(15.3)	

^a Significance test of difference between T2 cohort and T1-only participants.

Note: Column totals may be lower than expected due to missing data.

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Table 3. Summary of key personal, social and environmental characteristics measured in the READI cohort at T1 and T2

Domain	Variables assessed	
	Women	Children
Biological & health-related	Self-reported height and weight Pregnancy status Menopause status Self-rated health	Measured height and weight
Demographic	Age Country of birth English language spoken at home Marital status Hours worked/week Shift/weekend work Dog ownership Number of children	Age Sex
Socioeconomic	Education level Employment status Spousal education level* Spousal employment status* Own and household income Home ownership status Motor vehicle access	

Table 3 (continued)

Behavioural		
Physical Activity	Leisure Transport Domestic Occupational	Accelerometer-determined physical activity Usual physical activities Organised sport Time outdoors
Sedentary Behaviour	Sitting TV viewing Computer use	Accelerometer-determined sedentary behaviour TV viewing Computer use Electronic games use
Eating behaviours	Fruit, vegetables, dairy, high-fat foods, selected other foods, beverage and alcohol intake Selected eating practices (e.g., skipping breakfast) Food security	Fruit, vegetables, selected other foods, high fat foods, beverages Selected eating practices
Other behaviours	Self-weighing frequency Weight loss/gain Smoking	
Psychological	Enjoyment Outcome expectancies Self-efficacy Intentions Behavioural skills & strategies Prioritisation Nutrition knowledge Stress Depression	Enjoyment Self-efficacy Mother's beliefs
Social	Childcare access Social support from family Social support from friends Social norms Neighbourhood social capital/cohesion	Direct social support Reinforcement Family involvement in TV viewing, PA & meals Rules & rewards Maternal feeding style Social norms
Environmental		
Perceived	Yard size	Yard size

	Number of televisions	Number of televisions
	Neighbourhood safety	Street type
	Neighbourhood aesthetics	Home PA equipment
	Neighbourhood walking environment	TV in bedroom
	Home food availability	Neighbourhood PA opportunities & facilities
		Neighbourhood road & personal safety
Objective (measured at T1 only)	Road network distance to schools and to food stores and physical activity facilities Density of food and physical activity facilities within areas, and within car and pedestrian network buffers of respondents' home (400m, 800m, 2km, 3km, 5km)	As per women

Abbreviations: TV: television; PA: physical activity
*if relevant

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Table 4. Multivariate associations between personal, social environmental and physical environmental correlates and healthy weight status ('resilience') in READI mothers (n=1840)

Factors	Adjusted OR ^a	Adjusted 95% CI	p ^b
Personal			
<i>Self-care related to healthy eating</i>			
Feel guilty for preparing healthy foods when family prefers to eat other foods	0.94	0.84, 1.05	0.258
Family's food preferences take priority over own food preferences	0.96	0.87, 1.06	0.418
Make time to eat healthy foods even when busy looking after family	1.34	1.21, 1.47	<0.0005
<i>Self-care related to PA</i>			
Make time for PA even when busy with family commitments	1.11	1.02, 1.20	0.016
Social environmental			
<i>Family support for healthy eating</i>			
How often does family eat healthy low-fat foods with you?	1.28	1.16, 1.41	<0.0005
How often does family encourage you to eat healthy low-fat foods?	0.81	0.73, 0.89	<0.0005
How often does family discourage you from eating unhealthy foods?	0.98	0.89, 1.07	0.624
<i>Family/friend/environment support for PA</i>			
How often does family discourage you from sitting around?	0.98	0.91, 1.06	0.652
Physical environmental			
<i>Home food availability</i>			
How often are energy-dense drinks available in home?	0.96	0.92, 1.01	0.087

Table adapted from MacFarlane et al. (2010)²⁹

Adjusted for country of birth, age, maternal education co-variates), clustering of mothers by suburb, and all other predictor variables listed.

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3 ^a Odds ratios (ORs) > 1 indicated that higher scores on the measure e.g. greater agreement
4 with self care statements, frequency of family support, or home food availability) were
5 associated with more healthy weight status. Odds ratios < 1 indicated the measure was
6 associated with less healthy weight status.
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8 ^b P-values were calculated using ordinal regression; P-values < 0.05 are bolded.
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Figure 1: Summary of women participants in the READI T1 survey 2007-8)

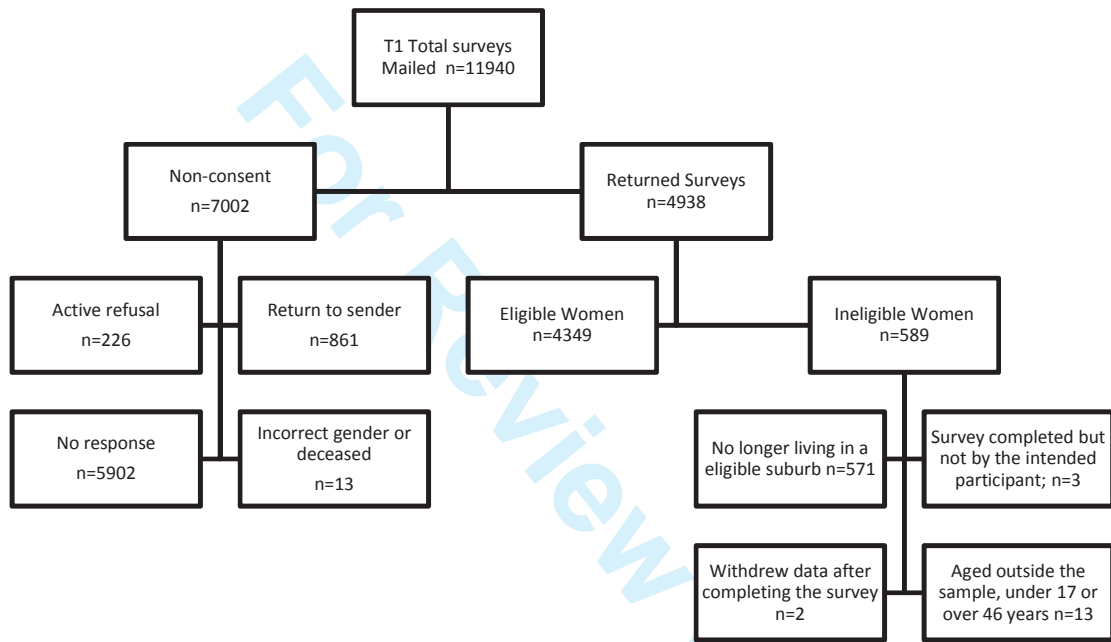
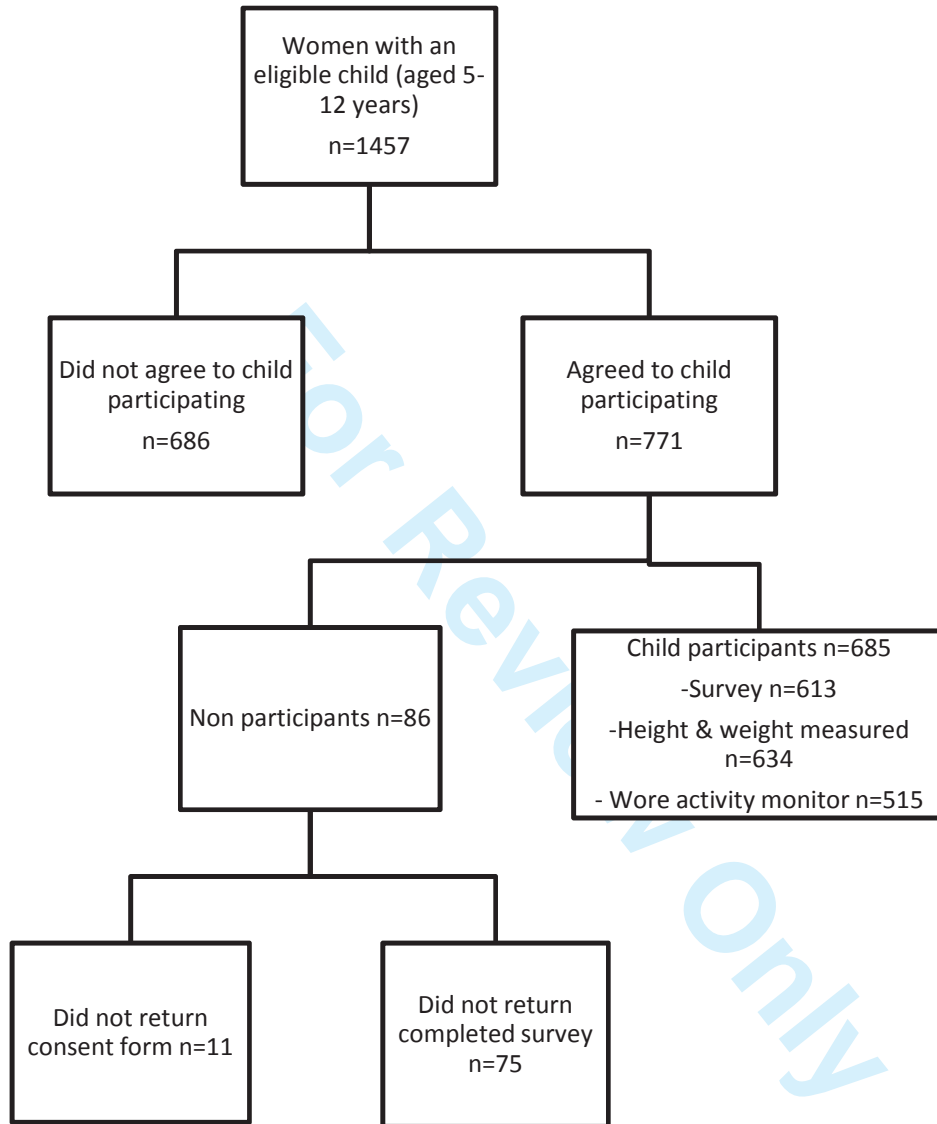


Figure 2: Summary of child participants in the READI T1 survey 2007-8)



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Figure 3: Summary of women participants in the READI T2 survey 2010-11)

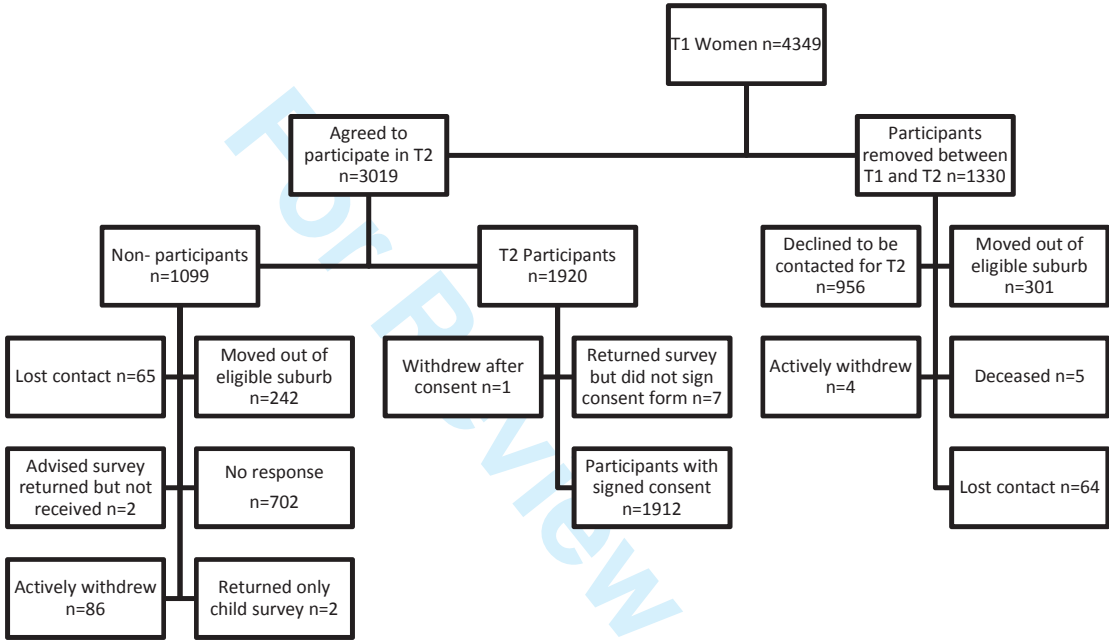
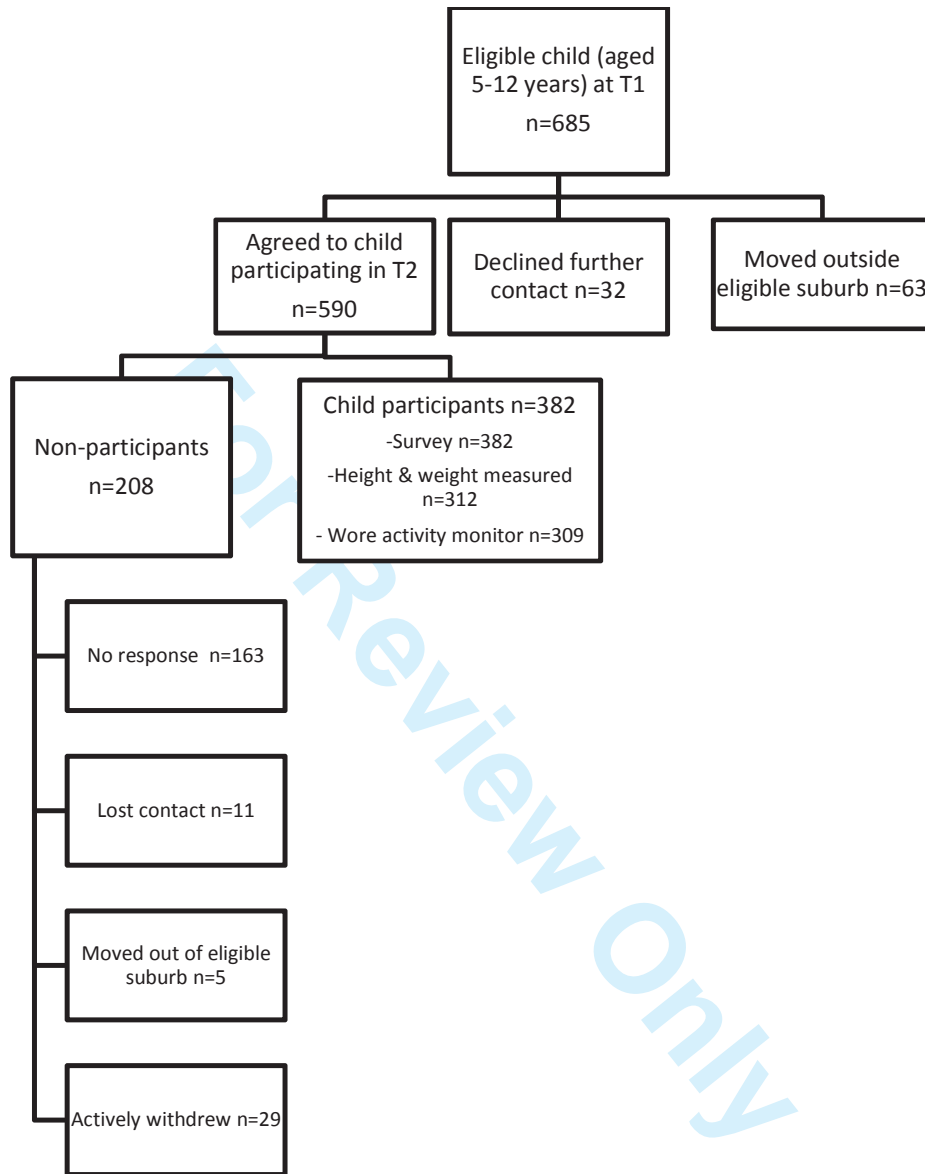


Figure 4: Summary of child participants in the READI T2 survey 2010-11)



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