national population studies and all are restricted to adult males. Moreover social and cultural contexts are very different between Australia and these countries, as are health systems, which limits the extent to which important research questions regarding social determinants and service use in the Australia context can be addressed by those data.

Responding to the National Male Health Policy, in 2011 the Australian Government Department of Health provided funding to establish the Australian Longitudinal Study on Male Health (Ten to Men) a national

SA1s, Inner and Outer Regional SA2s were the primary sampling unit and were randomly selected, once again with probability of selection proportional to size. This strategy was essentially the same as using the number of SA1s per SA2 as the measure of size since the correlation between the number of boys and the number of SA1s within an SA2 was 0.96. A fixed number of SA1s were then selected as a simple random sample within each of the selected SA2s. Sampling a fixed number of SA1s in each SA2 compensates for the higher initial probability of selection of a larger SA2 and delivers a sample in which each individual in the target population has an equal chance of selection. All eligible households within a sampled SA1 and all eligible males within a household were in-scope for inclusion.

Approximately 5.1 % of SA1s were removed from the final sampling frame. SA1s enumerated in the pilot studies were also excluded (1.4 %). A further 2,250 SA1s (4.1 %) were excluded because, as at the time of Wave 1 recruitment (October 2013), they formed part of three other national household studies and we sought to avoid recruitment difficulties and participant burden that may have arisen from overlap. As all three studies were probability samples it was considered that excluding overlapping SA1s would not introduce systematic bias (especially when viewed from a longitudinal, rather than cross-sectional perspective). With these exclusions the final sample frame comprised 50,236 SA1s.

Data were obtained from the Australian Bureau of Statistics on male population by study age groups, SA1 and SA2, and the three ASGS remoteness areas included. In order to oversample regional males 65 % of the sample was drawn from Major Cities, 20 % from Inner and 15 % from Outer Regional RAs (the population distribution being 70, 18 and 9 % respectively).

A total of 622 SA1s were enumerated. That number was determined by the available resources. The distribution of the 622 SA1s across regional strata was determined based on census data and response estimates from the pilot study and resulted in selection of 363 SA1s in Major Cities, 144 in Inner Regional RAs and 115 in Outer Regional RAs. The design of the sample did not aim to guarantee state/territory representation, but the final sample did include SA1s from every state and the two mainland territories.

Recruitment

Fieldwork was undertaken by the research services organisation Roy Morgan Research. All eligible households in a sampled SA1 and all eligible males within a household were in-scope for inclusion. Table 1 gives inclusion and exclusion cednr5(ofnc[D[(ing)25(andsc)5(-309(inclusa)4h9(inclu6GS)-369ra(gives)-53lusa)4h915t9t-7(o.6ata)-311(wer)(notlloc(e

Table 2

Questionnaires

Five broad domains for the questionnaire content were identified: health status, mental health and wellbeing, health behaviours, social determinants of health, and health knowledge and service use. Table 2 provides an overview of the constructs included within each domain and for each age group. Where possible the same measure was used across all age groups.

Where available, validated scales or questions were used or items were drawn from other large health studies. If no suitable measures were available the study investigators developed the questions. All such novel questions were subjected to cognitive testing and had their performance evaluated in pilot testing.

Ethics approval

The Human Research Ethics Committee at the University of Melbourne approved the study. Ethics approval was obtained from the Australian Government Department of Health to link data from the Medicare Benefits Schedule and the Pharmaceutical Benefits Schedule.

Pilot studies

Two pilot studies were conducted to determine the optimal recruitment method, test questionnaire performance and trial operational protocols. Roy Morgan Research conducted the fieldwork for both pilot studies.

Pilot Study 1 (Oct 2012) tested a mail-out method with postcodes as the principal sampling unit. Six postcodes in South Australia and Victoria were included. Potential participants were identified from the national

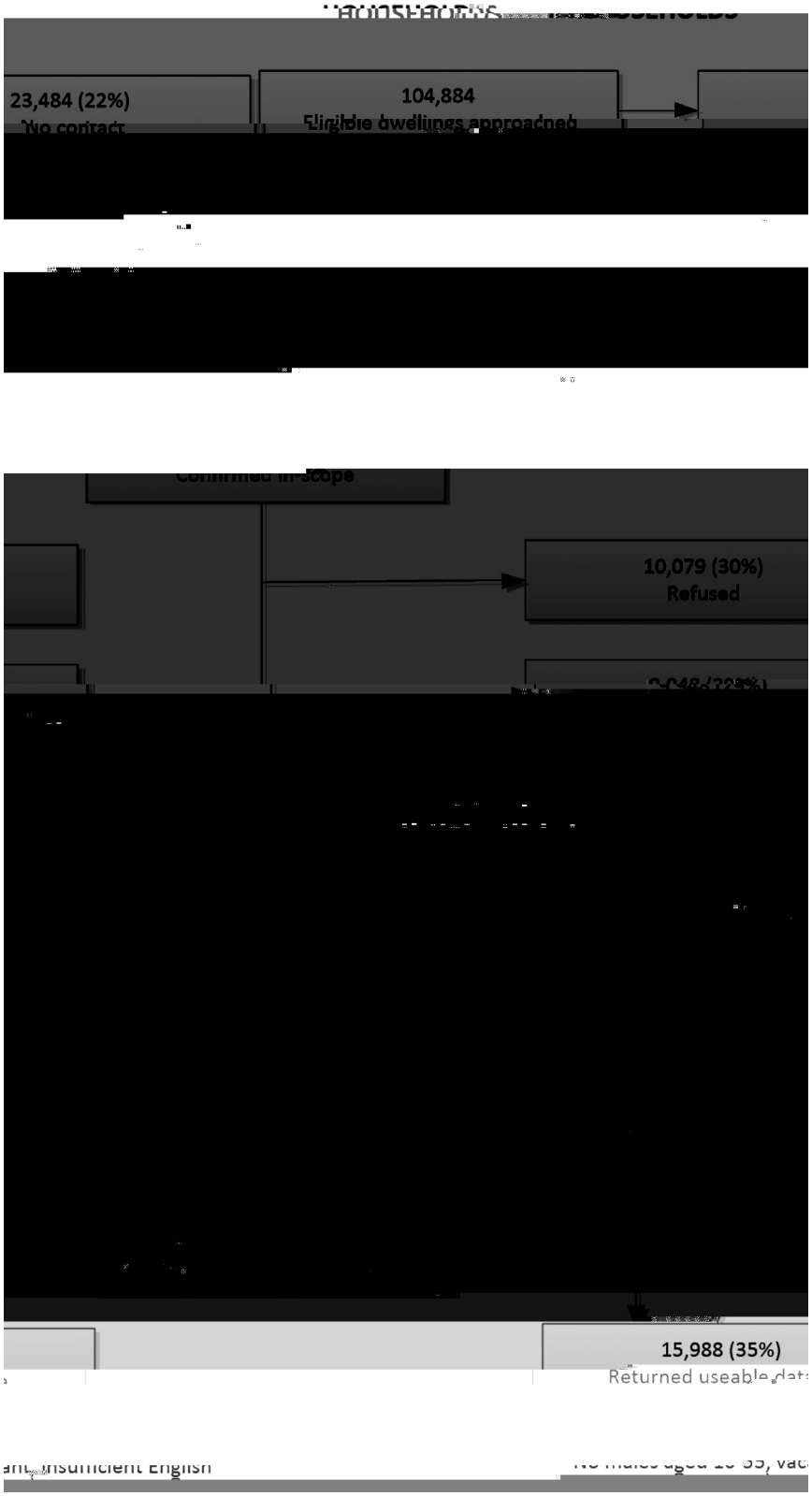

Fig. 1 Household and Individual Response

and comparisons with 2011 Census data. The Ten to Men cohort is older, more likely to be Australian-born, and more likely to live in regional areas reflecting the sample design. The proportion of indigenous Australians is similar to that recorded in the general population. A slightly larger proportion of the cohort lives in areas of highest disadvantage and slightly smaller proportion in areas of lowest disadvantage (1st and 5th socioeconomic quintiles respectively) [32].

Discussion

Ten to Men represents a major investment in building the knowledge base on male health to support the development of policies and programs addressing the premature mortality and preventable disease burden in Australian males. The breadth of data collected, particularly the focus on social determinants of health, the wide age range of the cohort and the oversampling of rural and regional males enables complex modelling of the relative importance of, and interactions between, health behaviours, environments and health outcomes over the

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