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Cohort Profile: The Concord Health and Ageing in Men Project (CHAMP)

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How did the study come about?

Epidemiological studies on ageing have tended to focus on women, a phenomenon recognized by sociologists as the feminization of ageing. However, a large percentage of older people are men. For example, in Australia, 44% of those aged 65 and over are male, as are 39% of those aged 75 years and over. Furthermore, the 5–7 year shorter life expectancy for men than women and higher death rates at all ages, including older ages, suggest that more detailed study of the health of older men is essential.

Probably the best known study of the health of ageing in men is the Massachusetts Male Aging Study.[1] However, at baseline, men in the Massachusetts Male Aging Study were relatively young, with a mean age of 58 years (range: 40–70 years). The recently established European Male Ageing Study also involves mostly younger men (range: 45–79 years).[2] The Concord Health and Ageing in Men Project (CHAMP) was established to investigate health in old men, defined as age 70 years and over. There is no upper age limit for recruitment into CHAMP.

CHAMP is funded by the National Health and Medical Research Council of Australia. Current funding is for baseline assessments and a two-year follow-up assessment. Additional funding will be sought to allow biennial assessments for at least 10 years. Recruitment of study subjects mainly occurred during 2005 and 2006, with the first follow-up assessments in early 2007.

What does it cover?

CHAMP is grounded in the principles of geriatric medicine and is mainly concerned with the causes and consequences of the major geriatric syndromes: falls, bone strength and fractures, cognitive impairment and dementia, urinary problems and poor mobility and functional dependence. CHAMP will facilitate the investigation of the inter-relationships between these health problems. The health effects of age-related declines in reproductive hormones (both androgens and estrogens) are a particular focus of the study.

Short-term follow-up of CHAMP participants will enable identification of risk factors for falls, loss of bone mineral density and declines in functional performance (e.g. gait speed). Risk factors for fractures, dementia, functional dependence and nursing home admission will be identified after longer-term follow-up.

CHAMP also has descriptive objectives made possible by selection procedures designed to produce a representative group of older men. An important objective is to describe levels of reproductive hormones in a representative sample of older men, and rates of decline with increasing age. Baseline data will also be used to describe the prevalence of osteoporosis, sarcopaenia (low muscle mass), urinary problems, functional dependence and dementia and mild cognitive impairment (MCI). Follow-up will allow description of the incidence of these conditions, as well as incidence of fractures.

Who is the sample?

CHAMP involves men aged 70 years and over living in a defined geographical region (the Local Government Areas of Burwood, Canada Bay and Strathfield) near Concord Hospital in Sydney. The sampling frame was the New South Wales Electoral Roll. Registration on the Electoral Roll is compulsory in Australia. The only exclusion criterion was living in a residential aged care facility. Eligible men in the study area were sent a letter describing the study and, if they had a listed

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Table 1 Baseline socio-demographic characteristics of subjects in the Concord Health and Ageing in Men Project (CHAMP)

Characteristic	*N* (%)
Age group	
70–74	673 (39.5)
75–79	536 (31.4)
80–84	315 (18.5)
85–89	135 (7.9)
90–99	46 (2.7)
Country of birth	
Australia	849 (49.8)
China	46 (2.7)
Great Britain	78 (4.6)
Greece	65 (3.8)
Italy	335 (19.6)
Other	332 (19.5)
Marital status	
Married/de facto	1310 (76.8)
Widowed	220 (12.9)
Divorced/separated	90 (5.3)
Never married	85 (5.0)

telephone number, were telephoned about one week later. Men without listed telephone numbers who did not respond to the first letter were sent a second invitation letter. Recruitment occurred sequentially across the geographic study area, with invitation letters being sent out each week during the recruitment period.

Baseline data were collected between January 28, 2005 and June 4, 2007. Invitation letters were sent to 3627 men and contact was made with 3005. Most of the 622 men who were not contacted did not have a listed telephone number. One hundred and ninety of the contacted men were not eligible for the study because they had moved out of the study area, moved into a nursing home or had died. Of the 2815 eligible men with whom contact was made, 1511 participated in the study (54%). An additional 194 men aged 70 years or more living in the study area volunteered to be in the study independently of the invitation letter system. These men were told about the study by friends or read reports about the study in local newspapers. Including these 194 men in the numerator and denominator gives a participation rate of 47%: (1511 + 194)/(3627 invitations sent + 194 volunteers − 190 ineligibles).

The baseline participation rate of 47% is similar to other large Australian epidemiological studies involving older men and a clinic visit, such as the Australian Longitudinal Study of Ageing[3] and the Dubbo Osteoporosis Epidemiological Study.[4] The baseline participation rate in the Massachusetts Male Aging Study was 53%.[1]

Table 1 shows some socio-demographic characteristics of the study subjects. Ages ranged from 70 to 97 years; the mean age at baseline was 77 years The age distribution of men in CHAMP men is similar to that of men in the target population: 71% of CHAMP men were aged 70–79 years at baseline compared to 73% of men aged 70 and over in the study area in the 2001 Australian Census; 26% were aged 80–89 years (23% in the Census) and 3% were 90 years or older (4% in the Census).[5]

How often are participants followed up, and what is the rate of loss likely to be?

Men are contacted by telephone every four months and asked whether they have had any falls, fractures or hospitalizations in the period since the previous follow-up phone call. For fractures, information is collected on the fracture site, date and place of treatment. For hospitalizations, information is collected on reason for admission and the date and place of admission. It is planned to review medical records, including radiographs, to validate self-reported fractures and diagnoses. The telephone calls are also useful for identifying men who have been admitted to residential aged care facilities and men who have died. The NSW Registry of Births, Deaths and Marriages will also be used to ascertain deaths in the study cohort.

It is planned to conduct detailed two yearly follow-up clinic visits for at least 10 years. However, only the first follow-up clinic visit has funding at present. The first follow-up examinations commenced in January 2007. Information collected at the first two-year follow-up examination is essentially the same as that collected at the baseline examination. Subjects who have moved into residential aged care facilities are not invited for follow-up examinations. Of the first 631 subjects due for the two-year follow-up examination, 75 (12%) have not attended, of whom 30 had died. Of the 45 living men who have not attended for the two-year follow-up examination, 35 have been happy to continue to receive four monthly follow-up phone calls.

What has been measured?

Table 2 shows the information collected in CHAMP. Men complete a questionnaire at home before coming to the study clinic at Concord Hospital. The questionnaire takes about 45 min to complete and the clinic visit lasts about 3 h. About half the measures in CHAMP are identical to those used in the MrOs Study

Table 2 Measurements in the Concord Health and Ageing in Men Project (CHAMP)

Measures	Instruments
Questionnaires	
Activities of daily living	Katz,[9] Rosow–Breslau,[9] OARS[10]
Health-related quality of life	SF12[11]
Physical activity	PASE[12]
Psychological health	CAGE,[13] Geriatric Depression Scale (15-item),[14] Goldberg Anxiety Scale,[15] IQCODE,[16] Neuropsychiatric Inventory[17]
Social Support	Duke Social Support Index (11-item)[18]
Urinary symptoms	IPSS,[19] ICIQ[20]
Other: family history (dementia, fractures, prostate cancer), health service use, lifestyle (alcohol, smoking), medical history and medications, pain (musculoskeletal and chronic), reproductive and sexual history and socio-demographic characteristics.	
Examinations	
Anthropometry	Height and weight, and hip, waist and neck circumference
Balance	Sway metre,[21] 6 m narrow walk
Bone	DEXA (hip and spine BMD), lateral vertebral morphometry, heel ultrasound
Cardiovascular system	Blood pressure (lying and standing), heart rate
Cognitive function	ACE,[22] MMSE,[23] Trails B,[24] Color Form Sorting Test,[25] Logical Memory[26]
Gait	Walking speed (6 metre walk), video of walk
Muscle strength	Grip strength, quad strength,[21] repeated chair stands
Respiratory function	FEV1
Sarcopoenia	DEXA (lean body mass)
Urinary function	Uroflow, post-void residual
Vision	Acuity, contrast sensitivity, depth perception
Blood tests	
Routine biochemistry and haematology	ALP, ALT, albumin, bilirubin, calcium, cholesterol (total and HDL), creatinine, electrolytes, glucose, phosphate, PSA, triglycerides, urea, full blood count (haemoglobin, leucocytes, platelets)
Bone-related measures	Bone turnover markers, PTH, vitamin D
Reproductive hormones	FSH, LH, estradiol, SHBG, testosterone
DNA	Genes associated with ageing
Other	IGF-1, IL-6

of osteoporotic fractures in men, being conducted in the US, Sweden and Hong Kong.[6]

Up to 80 ml of fasting blood is taken. Venipuncture is done at the clinic visit if possible; however, subjects with an afternoon clinic appointment have blood taken in their own homes, usually on the same day as their clinic appointment. Routine blood tests are performed immediately in the Concord Hospital clinical laboratory; the remaining blood is centrifuged, aliquotted and stored in a −80°C freezer in the ANZAC Research Institute in the grounds of the hospital. Funding has recently been received to allow DNA extraction.

Soon after the clinic visit, a telephone interview is conducted with an informant, usually the subject's wife. The informant interview is used to help identify subjects with cognitive impairment and also to assess presence of any psychiatric problems. Men who score 26 or below on the Mini-Mental State Examination or 3.6 or higher on the Informant Questionnaire on Cognitive Decline in the Elderly are invited to have a detailed dementia assessment performed by a geriatrician,[7]

Table 3 Baseline prevalence of self-reported health conditions among subjects in the Concord Health and Ageing in Men Project (CHAMP)[a]

Condition	*N* (%)
Angina	293 (17.7)
Arthritis	868 (51.7)
Chronic lung disease[b]	217 (12.9)
Congestive heart failure	86 (5.2)
Depression	150 (8.9)
Diabetes	308 (18.3)
Heart attack	311 (18.7)
High blood pressure	780 (46.2)
Hypothyroidism	38 (2.3)
Parkinson's disease	32 (1.9)
Prostate cancer	181 (10.7)
Stroke	143 (8.5)

[a]Subjects were asked 'Has a doctor or other health care provider ever told you that you had or have .....?'
[b]Chronic obstructive airways disease, chronic bronchitis, asthma, emphysema, COPD.

which takes 1–2 h. A final dementia diagnosis is achieved at a consensus meeting attended by two geriatricians, a neurologist and a neuropsychologist.

What has the study found?

Baseline data are currently being analysed and only a small number of preliminary findings are presented here. The prevalence of some self-reported medical conditions is shown in Table 3. As expected, the prevalence of cardiovascular disease and related risk factors was high: 19% reported having a heart attack, 9% said that they had a stroke, 18% reported diabetes and 46% hypertension. Over 50% of men reported having arthritis. Despite the high frequency of medical conditions, most men rated their health compared with others their age as excellent (16%) or good (54%). These findings are similar to those of a recent Australian national telephone survey of male reproductive health, the MATeS study.[8] MATeS involved nearly 6000 men, including 915 men aged 70 years and over, and had a 78% participation rate. Among men in MATeS aged 70 years and over, 11% reported having had a stroke, 13% reported diabetes, 47% hypertension and 73% reported good or excellent health. The similar findings in MATeS and CHAMP suggest that the men in CHAMP are a representative group of older Australian men.

What are the main strengths and weaknesses?

The main strengths of CHAMP are the advanced age of the study subjects, the representative nature of the study sample, the likely low loss to follow-up and the broad range of information collected which will allow study of the inter-relationships among geriatric syndromes, medical conditions and physiological and genetic variables. Another strength is that the CHAMP study population includes over 300 men born in Italy, allowing comparisons between these Italian immigrants and the Australian-born men (mostly of British or Irish ancestry).

The main weakness of the study is that, despite a sample size of 1705, it will be several years before the study will have the statistical power to allow analyses of risk factors for incident hip fractures and dementia. Another weakness, inherent in the study design, is that all subjects in CHAMP are male. This means that it is not possible, for example, to directly address the question of why life expectancy of older men is less than that of older women.

Can I get hold of the data? Where can I find out more?

Access to CHAMP data is covered by a Project and Publication Guidelines document. It is anticipated that the majority of publications arising from the CHAMP data will be initiated by the CHAMP investigators. However, there is scope for involvement of other researchers. Further information is available from RGC.

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