

NATIONAL CENTRE FOR EPIDEMIOLOGY & POPULATION HEALTH

MODELLING SEXUALLY TRANSMITTED INFECTION AND ITS CONTROL

PhD SCHOLARSHIP



- Do you have quantitative research skills?
- Do you have computer programming skills?
- Are you interested in the biological or biomedical sciences?
- Are you interested in a public health career?

A generous PhD scholarship is available to undertake research funded by an ARC Linkage grant entitled 'Planning Female and Male Vaccination and Cervical Screening Strategies to Achieve Optimal Prevention of HPV-Related Disease'. The scholarship is open to applicants wishing to undertake a program of full-time research toward the award of PhD and offers an excellent opportunity to conduct research within a world class supportive and well resourced environment.

The ideal candidate will have an undergraduate Honours degree in a quantitative science (eg, mathematics, statistics, engineering, physics, computer science, economics) and solid computer programming skills. Background in the biological or biomedical sciences will also be viewed favourably. The project will involve the development of mathematical models to investigate the health-economic impact of vaccination, screening and testing programs for reducing disease caused by the human papillomaviruses. Additional funding is available for scholarship supplementation, fieldwork and conference attendance.

A more detailed description of the project, and a complete list of essential and desired criteria, are on the next page.

The position is nominally intended to be based in Canberra but a Sydney placement will be considered for the appropriate candidate.

FURTHER INFORMATION

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Project and Position Description

The project

Human papillomaviruses (HPV) are known to be the causative agent in the vast majority of cervical cancers and genital warts. They are also associated with a proportion of other anogenital cancers, head and neck cancers, and juvenile onset recurrent respiratory papillomatosis. A government funded vaccination program has been introduced in Australia that entails the routine vaccination of 12 year old females as well as catch-up vaccination for females aged 13–26. The approved quadrivalent vaccine has been shown in clinical trials to be highly effective at preventing precancerous lesions due to HPV types 16 and 18, which are associated with 70–80% of cervical cancers, and genital warts due to HPV types 6 and 11 which cause >90% of genital warts. The vaccine is approved for boys aged 9 to 15 years of age but vaccination of boys is currently not publicly funded.

Researchers from The Australian National University, The University of New South Wales, The University of Melbourne, and La Trobe University, in partnership with CSL Ltd and Victorian Cytology Service Inc., have been awarded an ARC Linkage grant entitled "Planning female and male vaccination and cervical screening strategies to achieve optimal prevention of HPV related disease". The project involves the development of mathematical models to investigate the population-level impact of vaccination on HPV transmission and HPV-related disease. The models will be used to estimate the cost-effectiveness of various vaccination strategies, including the vaccination of males, and will consider these in the contexts of the current cervical screening program (PAP testing), potential revised screening guidelines, and the introduction of new HPV testing technologies. The models will also be used to investigate ecological and immunological questions regarding type replacement and cross-protection against non-vaccine HPV types. Specific questions to be addressed during the course of the study are as follows:

1. What will be the impact and cost-effectiveness of vaccination on the incidence of all HPV-related cancers (cervical, other anogenital, head and neck), recurrent respiratory papillomatosis (RRP) and genital warts in men and women?
2. What would be the population level impact of vaccinating males (in addition to females) on further mitigation of transmission and reducing the incidence of genital warts and anogenital cancers in males? Will it be cost-effective? To what extent does female-only vaccination benefit males?
3. What would be the cost-effectiveness and population level impact of changes to cervical screening policy (e.g., screening interval, age at first screen, addition of liquid-based cytology and/or HPV (DNA) testing) in the context of mass vaccination?
4. What impact will vaccination with the currently licensed vaccines have on the incidence and prevalence of non-vaccine HPV types and how might this change with the introduction of higher valency vaccines?
5. What is the scope for elimination of vaccine HPV types?
6. What are the key surveillance indicators that must be monitored at a population level to track the impact of vaccination most efficiently?

The Position

The scholarship is available for a candidate to undertake full-time research towards the award of PhD for a period of 3 years with the possibility of a 6 month extension upon application to the ARC if required. The candidate will work closely with the lead investigators and in collaboration with our partner organisation investigators. The project is multifaceted and involves the integration of both health-economic and epidemiological components. The candidate will have the opportunity, depending on his/her experience and areas of interest, to work on all aspects of the project and to interact with investigators at the various academic institutions and partner organisations. The ideal candidate will have a strong background in quantitative science (e.g., mathematics, statistics, engineering, physics, computer science, economics) and computer programming skills as well as a background or strong interest in biological or biomedical science, epidemiology, public health, or policy. The scholarship stipend will be generously supplemented and there will be opportunities for fieldwork and conference/workshop attendance. This scholarship provides a unique opportunity for a motivated candidate to work in an academically challenging, nurturing and supportive environment, and to make an important contribution to the development of public health policy.

Essential criteria

- Undergraduate Honours degree in quantitative science (e.g., mathematics, statistics, engineering, physics, computer science, economics).
- Computer programming experience (e.g., C/C++, Java, Fortran).
- Willingness to be based in Canberra (preferably) or Sydney.

Desired criteria

- Experience with Matlab and/or Mathematica/Maple.
- Background/interest in field/s relevant to the project (e.g., biological or biomedical science, biostatistics, epidemiology, public health, policy).