**Category 6:** Support for faculty members moving into **significantly different** areas of research or scholarship.

**Population Dynamics and Implications for Health and Health Care**  
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1. **Category Justification:** The project represents a pivotal change in the research focus of the principal investigator (PI), Ross Macmillan, from the theories and methodologies of sociological criminology to those of social demography and social epidemiology as a vehicle for doing research on public health. Macmillan is a sociologist with primary training in criminology and socio-legal studies. The substance and methodology of his research reflects these interests and include studies of crime trends, the nature and consequences of criminal victimization, public opinions on crime and criminal justice, public responses to crime and victim reporting, and offending over the life span. These contributions speak to seminal issues of the social context of offending and criminal justice and have appeared in leading journals in criminology, socio-legal studies, and sociology.

Beginning in 2005, the PI began to shift the emphasis of his work to life course demography and public health research. This shift is motivated by an intellectual interest in pursuing more interdisciplinary research on social problems, as well as long-standing interests in issues of quality of life. The work described in this proposal solidifies this shift by directly engaging with issues of population dynamics, social epidemiology, and the health and health practices of contemporary Americans. The first step in this process involved intensive training in formal demography. Specifically, the PI participated in an eight-hour a day, two week seminar (the rough equivalent of the standard two semester graduate sequence of most American demography programs) sponsored by the National Science Foundation and Stanford University. This seminar featured senior demographers from across the globe speaking on key theoretical and methodological issues in the field.

The second step, addressed through this application, is to gain expertise in epidemiology and public health research. In many ways, public health research, including epidemiology, involves theoretical perspectives, knowledge bases, and empirical methods that are unique and specialized. At the same time, there is increasing recognition that population dynamics at both individual and societal levels, the bread and butter of the mainstream social sciences, are deeply implicated in health and health care. As a result, better integration of population demography and public health perspectives holds great promise for expanding knowledge of the fundamental causes of health and health disparities. The shift in research for the applicant has the potential to enhance dialogue between the two fields and provide an interdisciplinary perspective that many see as the future of health research. Grant-in-Aid funding would enable the PI’s change in research area by providing seed money to execute population-health projects that involve collaboration with J. Michael Oakes, an internationally known social epidemiologist at the School of Public Health. The projects described below will further lay a foundation for applications for external funding from the National Institutes of Health, the National Science Foundation, as well as other agencies interested in population health.

2. **Abstract:** As population processes are increasingly recognized as an engine of public health, the goals of the proposed project are two-fold. First, the PI seeks to gain increased knowledge, training, and research expertise in social epidemiology and public health research. Second, the applicant seeks small financial support for base research and research assistance for the production of proposals for external funding on topics of population dynamics and health. The latter will focus on projects that examine a) the nature of health and health disparities among immigrant and non-immigrant populations and their change over time; and b) the impact of changes in the age-structuring of social roles (e.g., schooling, paid employment, family) on health and health care practices of individuals. Each of these projects is united by the effort to better understand health by integrating social science and epidemiological perspectives and methods and the use of high quality health data.

3. **Present Status of Knowledge:** Recent years have seen considerable debate over the nature of public health and what paradigms and methods are most suitable for understanding and subsequently improving the health of populations (Krieger 2000; Susser and Susser 1996). Although the scope of debate is broad, a key issue is the extent to which social science perspectives are or are not central for the study of public health (Krieger 2000; Oakes 2005). Although often overlooked, the social sciences are particularly important in directing attention “upstream” to social and ecological locations that are fundamental causes of health and life chances and hence a pivotal consideration for primary intervention (Oakes nd). Examples such as the HIV/AIDS epidemic in Africa and parts of Asia...
highlight the importance of both biological and social dimensions of disease processes to understand their transmission, their consequences for individuals and communities, and to design more effective interventions (Palloni 1996). Likewise, recent outbreaks of small pox regardless of a widely available vaccine (Ferguson et al. 2003 and the continued role of treatable diseases such as malaria in child mortality (Rutstein 2000) reinforce social contexts as environments that facilitate or inhibit disease processes, regardless of medical advances. In general, these examples echo the significant social differentiation in health that indicates the importance of social, structural, and ecological conditions (Braveman 2006; Link and Phelan 1995) and point to the important contributions of social science perspectives.

Still, many facets of public health research are quite divorced from the theories, methods, and research of the social sciences. Krieger (2000), for example, points to weak linkages between epidemiology and the social sciences, while Pearce (1996) stresses the limits of an epidemiology that does not incorporate socioeconomic and population factors into explanations. Oakes’s (2005) study of citations buttresses such arguments by showing that researchers publishing in mainstream epidemiology journals, notably the American Journal of Epidemiology, are extremely unlikely to cite work from major social science venues (e.g., Demography, the American Sociological Review, the American Economic Review). Yet contrary to this epistemological divide, government and scientific agencies increasingly emphasize interdisciplinary engagement as the cornerstone of scientific advance, particularly in fields such as public health. For example, the recent statement on “Long Range Planning” for the Demographic and Behavioral Sciences Branch of the National Institute of Child Health and Human Development (US Department of Health and Human Services 2006) explicitly acknowledged the need for research on “biosocial linkages and health” that involves interdisciplinary research teams, greater incorporation of behavioral and social science perspectives in medical research, and better integration of biomarkers into studies of social, familial and other environmental contexts affecting the body. In contrast to such calls, the current state of affairs is one where theories and research on public health are somewhat divorced from those of the core disciplines in the social sciences.

The PI seeks to engage in research that explicitly integrates theories and methods of population demography, social epidemiology, and public health to conduct research on the roles of immigration and assimilation in the health experiences of immigrants and the changing social structure of the early life course and its impact upon health.

4. Plan of Work: For the projects described below, the primary goal and the explicit use of the Grant-in-Aid funds will be for research assistance to produce data sets and conduct preliminary analyses that can be used to develop applications for external funding for population-health research. GIA funding will also serve long-term objectives by providing a learning space for the PI to better understand theories and methods of social epidemiology and public health.

The proposed research will use the Integrated Health Interview Series (IHIS). These data are a principle source of information on the health of the US population covering topics such as general health, the distribution of acute and chronic illness, functional limitations, and access to and use of medical services. The IHIS data consists of over 800 integrated variables for national probability samples drawn annually from 1969 to 2005. Although size and coverage varies, all samples contain over a 100,000 respondents which allow for detailed comparisons across subsamples defined by geography, nativity, and age, as well as analysis of specific diseases as they are distributed across the population. In short, they are uniquely ideal for multidimensional inquiry into population-health dynamics.

A. Project #1: A first project further considers the “immigrant health paradox” where immigrant populations tend to have better health than similar Americans yet lose this advantage over time (Antecol and Bedard 2006). At the same time, recent census data shows that the foreign born population in the US reached an all-time high of over 32 million by 2000, constituting 10 percent of the population. Thus, the health of immigrants and their dynamics over time is increasingly important for understanding the health and health care in the American population. As such, assimilation processes that characterize the routine life courses of immigrants have important implications for health and social policy.

Within this body of research, key questions remain. First, most research has focused on very general indicators of health rather than specific conditions or diseases, likely due to the fact that immigration is typically studied by social scientists while disease and disease processes are largely the province of epidemiologists. Second, there have been only limited attempts to examine health conditions and
risks for specific immigrant groups, regardless of the changing face and character of immigration seen in recent decades (Isbister 1996; Pedraza 1994) and increasing evidence of a global geography of illnesses (Meade and Earickson 2000). Third, much of the research has not considered health, access to health care, and health care practices as joint phenomena despite the changing economics (Bartley and Owen 1996), technology (Bronzino, Smith, & Wade 1990), and even culture (Helman 2007) of health care that is likely to play out differently in immigrant and non-immigrant populations. Thus, a more detailed investigation of the immigrant-health relationship will help better understand specific and differential risks among immigrant populations and would greatly advance understanding of the relationship between health, immigration, and assimilation. Moreover, the health implications of immigration were specifically noted as a priority area by the Long Range Planning Committee of the Demographic and Behavioral Sciences Branch of the National Institute of Health.

Using the IHIS data, information on nativity including the length of time in the US can be combined with measures indicating global region of birth and/or ethnicity. Here, there is an average of 12,510 immigrants which allow for quite specific comparisons. Complementing this is information on general health, body mass index, health limitations, and detailed indicators of specific diseases and conditions, as well as indicators of medical care access and utilization. Analyses would involve conventional statistics for comparisons across groups (e.g., ANOVA, t-tests), demographic techniques for the calculation of age-standardized rates, and models for the multivariate analysis of categorical and limited dependent variables (e.g., logit regression).

B. Project #2: A second project focuses on the changing nature of the life course and its implications for health gradients over time. A central issue in population research is how the transition to adulthood changed in the latter decades of the 20th century with respect to the order and timing of schooling, paid employment, marriage (cohabitation), parenthood, and independent living. Here, scholars debate whether the life course has become increasingly "individualized" with increased disorder in role sequences, increased role overlap, and looser and lengthier transitions between roles (Macmillan 2005; Fussell and Furstenberg 2005). Research also stresses increased differentiation and diversity by class, race, gender, and even nativity (Brayboy-Jackson & Berkowitz 2005; Furstenberg 2003). To date, there are no explicit examinations of the health implications of the changing structure of the life course.

Expectation of important health implications are anticipated by research that links health to the various roles that people occupy, including schooling, work, and family (see for example, Waldron, Hughes, & Brooks 1996), as well as the way in which roles are combined (Moen, Dempster-McClain, & Williams 1992). To extend such work, the proposed research will directly examine the age-graded structured of the life course, its change over time and its (changing) implications for health and health care. Specifically, the research will examine a) configurations of social roles across age and time period; and b) examine their relationship to health, health care accessibility, and health care practices. Such inquiry dovetails with another priority area of the National Institute of Child Health and Human Development, specifically the transition to adulthood, and is also related to focal themes of private funding agencies such as the MacArthur Foundation (and its Research Network on the Transition to Adulthood) and the William T. Grant Foundation.

Age differentiation in the IHIS data is well defined with each survey having over 1500 respondents at each age between the ages of 16 and 35. Age-graded roles can be measured with IHIS variables such as employment status, major activity, educational attainment, marital status, and living arrangement. All these measures are available for the years 1969 to 2005 and thus are suitable for mapping changes over time and changing relationships to health and health care over time. Health outcomes are the same as those described above.

Analytically, the research will employ latent variable modeling techniques such as latent class analysis to formally model the nature and prevalence of age-specific role configurations over time and then use such variables in traditional linear models, including those for categorical and other limited dependent variables, to predict health and health care outcomes. In general, the scope of the IHIS data provides considerable analytic power in examining the multidimensional character of social roles at given ages, how these change over time, and their relationship to various dimensions of health and health care utilization.

C. Collaboration and Training: The preparation of these proposals and future research in social epidemiology will be aided by a collaborative relationship with J. Michael Oakes, Associate Professor of Epidemiology and McKnight Presidential Fellow. Professors Oakes and the applicant have worked together in various capacities through the Minnesota Population Center for several years and are
currently collaborating on a T-32 Training Grant application for the National Institute of Health. In
addition, the applicant has a reduced teaching load in 2008-2009 and will audit courses in the
Principles of Public Health Research (PUBH 6806) and Social Epidemiology (PUBH 6390).

References:

Health Status Levels?” Demography, 43: 337-360.

Bartley, M. & C. Owen. 1996. “Relation between Socioeconomic Status, Employment and Health


Variation in the Occurrence and Sequencing of Role Transitions.” Pp. 55-90 in R. Macmillan (ed). The

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Amsterdam: Elsevier.


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and Social Behavior, Extra Issue: 80-94.


Women’s Multiple Roles and Health.” American Journal of Sociology, 97: 612-638.


Future’s Symposium Grant Application to UMN’s Vice President for Research.


5. Budget Justification: Personnel: A 50% RA: Put simply, this project is labor intensive. While the PI will provide overall direction of the project and assist in all facets of the research, the RA would be responsible for the retrieval and coding of the data, the creation of analytic datasets, and the analysis of said data. It is expected that the RA would also become conversant in theories and methods at the intersection of social science and public health and thus contribute to the emergence of an intellectual community of interdisciplinary researchers in this area. The PI has a strong track record of mentoring graduate students with an unbroken string of successful degree attainment, collaborative research, and career placement in strong departments across the country.

Miscellaneous Supplies: All of the research can be accomplished with available computing resources but will also produce considerable output. As such, the PI requests modest support for printing.

6. Need Justification: Large scale projects on issues of population and health are typically funded through national agencies such as the National Institute of Health or the National Science Foundation. Yet, the success of such highly competitive applications is strongly influenced by advanced preparation and preliminary analyses to show the merits of a given research project. This is particularly the case for researchers that do not have long track records of research on particular topics. Currently there is little to no seed money available for work that would assist in and enhance the generation of strong proposals. Moreover, the PI was recently appointed Director of the Life Course Center at the University which positions him to allocate seed money to others for population related research but also effectively removes him, due to obvious conflict of interest, from consideration for such monies.