

Project Description

Project Overview

PDG - A Multi-component Mixed-methods Study of the Dynamics of Population in Greenland will examine how decisions regarding conception, pregnancy and parenthood are shaped by multiple interacting constraints and influences operating in Kullorsuaq, an indigenous, predominantly youthful, rural community undergoing rapid economic and environmental changes. Cultural reproduction of communities and biological reproduction of individuals are necessarily linked, but rarely is this intimate nexus as evident as when facing unprecedented challenges to indigenous life ways. In Greenland, fertility and population growth are low and abortion rates are exceptionally high, especially among younger women, patterns that have raised Greenlanders' concern for population sustainability. These demo-graphic trends coupled with (and perhaps exacerbated by) climate change, expanded extraction of natural resources by foreign industries, and increasing emigration are placing current and future generations of Greenlanders and Greenlandic culture and practices in jeopardy.

Our project seeks to document and understand the interplay among the cultural, social, economic, and environmental factors that create the context in which Greenlandic individuals and communities make reproductive decisions. Our principal goals are to help to address, at the behest of Greenlanders, a pressing set of issues underpinning the well being and continuity of Greenlanders and their culture, to expand scholarship on Greenland's people, to advance the utility of that knowledge for the benefit of Greenlanders and other Arctic peoples, and to contribute to scientific understanding of the myriad factors that influence human reproductive choices.

To achieve these goals, our proposed research project is collaborative, comprising several interconnected components. Logistically, these components are organized in terms of addressing hypotheses (see below), each of which focuses on a specific set of factors (e.g. social, cultural, economic and environmental) that are posited to influence reproductive decision-making. The findings directly relevant to any one hypothesis will also inform evaluations of the others, thereby yielding a more comprehensive understanding of the context of reproductive choices in Kullorsuaq than would otherwise be possible. Befitting the multi-component structure of this study design, we will use qualitative and/or quantitative methods (e.g., in-depth interviews, participant observation) specifically tailored to each hypothesis.

PDG will be implemented using a community based participatory research (CBPR) framework that involves health and community partners in Kullorsuaq, members of Greenland's national public health sector in Nuuk and in the northern municipality which oversees Kullorsuaq, and faculty from the University of Greenland and Montana State University. Community members will provide oversight and guidance into the observations and interviews to take place in this study. Based on individual and focus group discussions with stakeholders involved in the process of interpreting study findings, *PDG* will develop and provide recommendations to policy makers in Greenland regarding how to improve the reproductive health of Greenlanders.

PDG is informed by previous CBPR project, *Inuulluataarneq* (Having the Good Life Study). This project successfully examined the sociocultural factors influencing sexual health in Greenland. *Inuulluataarneq*'s success is a principal reason the Greenland Government requested that we examine the reasons for high abortion rates in Kullorsuaq. For this project, we have gathered a research team that reflects the complexities of reproductive decision-making. Complementing Rink's expertise in CBPR and cultural and psychosocial influences on sexual and reproductive health in Greenlanders. Trøndheim adds indispensable knowledge of Greenlandic culture, especially regarding kinship and relationship dynamics. Collectively and in collaboration with the community, this team has the necessary experience and knowledge to investigate the factors influencing Greenlanders' reproductive choices.

Project Components. *PDG* is a 3-year collaborative study of Greenlandic ways of perceiving, understanding and experiencing pregnancy. Many aspects of reproduction are shared globally by all humans and thus some questions, and answers, are so fundamental to this experience as to seem universal. At the same time, human reproduction is a culturally bound experience (Jordon & Davis Floyd 1992, Ivry 2009, Stone & Selin 2009). *PDG* will examine how reproductive decision-making plays out among Greenlanders, and how it is influenced by both simple (e.g., age) and complex (e.g., cultural values) aspects of human life. Specifically, we will examine the interrelated factors likely to be influencing the reproductive decisions made by women and men, aged 15 and older, living in Kullorsuaq. As

described in greater detail in a subsequent section, the research hypotheses to be investigated in this community are:

Hypothesis 1 posits that individual characteristics (age, gender, physical and mental health, spirituality, and beliefs about sex, pregnancy, adoption and abortion) influence reproductive decision making.

Hypothesis 2 posits that the interpersonal dynamics in sexual relationships influence reproductive decision making among men and women.

Hypothesis 3 posits that there is an unmet need for contraception.

Hypothesis 4 posits mismatches between contraception methods and cultural perceptions and/or behavioral norms that hamper correct and consistent use of some methods.

Hypothesis 5 posits that cultural constructs regarding kinship, familial obligations and personhood influence pregnancy outcomes.

Hypothesis 6 posits that individuals' and communities' relationships with the area's natural and built environment influence reproductive decisions.

Project Activities. The principal sets of activities to be undertaken in *PDG* are:

Activity 1. Establish a CBPR framework for a social science study of reproductive health in Greenlanders.

1a: Establish a community advisory board in Kullorsuaq to provide oversight and guidance on the project.

1b: Through monitoring of process and outcome variables, evaluate the strengths and the challenges of CBPR as a conceptual framework for conducting social science research in Greenland.

Activity 2. Examine the individual attitudes, beliefs and psycho-emotional factors, and the social, cultural and environmental factors that appear to have the greatest influence on reproductive choices.

2a: Conduct ethnographic interviews and observations to understand how reproductive decision-making is determined by social, cultural and environmental factors.

2b: Conduct in-depth interviews with women and men to identify which of, and how, these factors most significantly influence their reproductive choices.

2c: Identify current institutional and government practices and policies that specifically influence reproductive choices.

Activity 3. Examine contraceptive use and discontinuation, experiences with method use including side effects, and variation in endogenous hormone levels and the factors that generate such variation.

3a: Concurrent with the interviews in Activity 2, assess the barriers and facilitating factors that influence non-hormonal contraceptive use (e.g., condoms, withdrawal, vasectomies) among men.

3b: Similarly assess the barriers and facilitating factors that influence non-hormonal (e.g. condoms, diaphragms, IUD) and hormonal (e.g., pills, injections) contraceptive use among women.

Activity 4. Mentor U.S. and Greenland students in CBPR methods and reproductive health research.

4a: Train and supervise student interns as they collect and/or analyze data from the ethnographic observations and in-depth interviews.

4b: Assist these students in developing international personal/professional networks and collaborate with them to articulate (e.g. in a paper or conference presentation) the lessons learned from their work.

Activity 5. Provide recommendations to policy makers for improving Greenlanders' reproductive health.

5a: Conduct focus groups with policy makers and stakeholders to discuss and interpret research findings and identify possible actions for improving reproductive health in Kullorsuaq.

5b: Develop and disseminate recommendations to governmental agencies, health care providers, and the larger Greenlandic community for improving reproductive health in Greenland.

Present State of Knowledge

Greenland was first inhabited by Inuit during the Thule migration (~800–1200 CE), and later colonized by Denmark in 1721. More than 80% of the population is predominantly Inuit or of Inuit descent; a significant foreign-born segment (about 11%) is predominantly Danish (Statistics Greenland, Jan 2010). Both Inuit and Danish cultures are influential in defining the Greenlandic identity (Nuttal 1992). Denmark granted Home Rule to Greenland in 1979 and Self Governance in 2009. Since World War II, Greenland has

transitioned from subsistence living to a market economy, generating rapid economic, political, social and cultural change. Most Greenlanders (75%) live in over 50 widely distributed small towns and settlements.

Community Based Participatory Research (CBPR). Because there are few Greenland-based research facilities and scholars, research there has been mainly community *placed* rather than community *based* (Isreal et al., 2001); i.e., studies have often only minimally involved Greenlandic communities in the development, design or implementation of research, or the analysis, interpretation and dissemination of results. *Inuulluataarneq* (Having the Good Life Study) was the first CBPR project to be conducted in Greenland (Rink et al., 2009). CBPR is an effective strategy for conducting research because it emphasizes community-academic partnerships that build mutual ownership of a research project and empower communities or groups to address their health disparities in a socially, culturally, and environmentally appropriate manner (Holkup et al., 2004; Mail et al., 2006). CBPR is beneficial from a scientific perspective because it joins the strengths, skills, and broad experience of researchers with the strengths, skills and local experience, knowledge and resources of the community, thereby enhancing the relevance, impact and ability to successfully conduct meaningful social science research that may improve health (Gesink Law et al., 2008). Because of this integration, CBPR enriches the interpretation of the quantitative and qualitative research results (Cargo & Mercer 2008; Isreal et al., 2001).

The initial findings from *Inuulluataarneq* suggest that important considerations for implementing a CBPR project in Greenland include: 1) working closely with the community for one to two years to build local capacity before beginning data collection; 2) using multiple methods of data collection (e.g., in-depth interviews, focus groups, community meetings) to address research hypotheses; 3) providing compensation for time and effort of community partners as well as research participants; 4) identifying key informants to assist researchers with establishing and maintaining a relationship with the community; 5) appreciation of the strong links between Greenlandic concepts of community and kinship networks; 6) appreciation of the relationships between social cohesiveness, access to education and social capital; 7) recognizing that varying educational and social competencies within communities affect a community's ability to participate in CBPR projects; 8) critical activities for building trust and an effective partnership between researchers and communities include community participation in the development of data collection methods and the collection and interpretation of data, and community-researcher sharing of data and findings (Rink et al., 2009; Rink et al., accepted 2012).

PDG will be conducted in Kullorsuaq (2007 population = 400) in northwestern Greenland above the Arctic Circle (Statistics Greenland, Jan 2007). Consistent with CBPR principles, Greenlandic political, health care and social leaders, and community members had selected this locale because of their concern with the community's high pregnancy rates among young people and because about half of Kullorsuaq's population is younger than 20 years of age. In 2009, because of their familiarity with *Inuulluataarneq* and that project's community based approach, key policy and health care stakeholders in Greenland asked Rink to work in Kullorsuaq. Findings from *Inuulluataarneq* suggest that communication within families regarding pregnancy planning and using birth control and/or condoms does not take place due to cultural and social norms regarding sex; sex partners inherently trust each other because of concepts related to connectedness, kinship ties and community interrelatedness and do not perceive it necessary to discuss birth control and/or condom use; and in Greenlandic youth culture sex, is perceived as cool and not associated with a perception of risk. These findings will inform *PDG* as they suggest a socio-cultural perception of sex that is not associated with risk or a need to plan or prevent a pregnancy.

Demographic Patterns & Pregnancy Outcomes in Greenland. As of 2009, Greenland's total population was 56,194 (29,809 males and 26,385 females), a decrease of 268 persons since 2008. Although births (899) outnumbered deaths (420), the population shrank due to migration (to Denmark and elsewhere) of both younger (for education) and older persons (for retirement) (LAF, 2009). As of 2011, the population growth rate is estimated at only 0.05%, ranking 188th of 230 countries (The World Factbook, 2011). As has been the case for some time, estimated fertility for 2011 is low. The crude birth rate = 14.6 births/1000 persons (rank=139th) and the total fertility rate (TFR, the average number of births per woman if all women lived to the end of their childbearing years and reproduced at current age-specific fertility rates) = 2.13 children/woman (rank=114th), only slightly above the replacement rate of 2.1 and about 10% lower than in 2009 (2.35 children/woman) (The World Factbook, 2011).

The low fertility and growth rates and high migration rates have prompted concern over the

sustainability of Greenland's population. The low fertility rate is, in large measure, a consequence of having the world's highest rate of legal abortions (Johnston, 2011). Since 2003, approximately half of all recognized pregnancies in Greenland have been medically terminated, almost all within the first 12 weeks of pregnancy (the legal time limit, with rare exceptions allowed). The abortion rate has risen steadily since 1967 (the earliest year for which data are available) and, perhaps, has leveled off in recent years but shows little sign of abating. In 2009, of 1698 recognized pregnancies, 799 (47%) were medically terminated. Given these rates, on average every Greenlandic woman of childbearing age will have 2 abortions in her lifetime. Despite the accessibility of abortion services in Greenland, medical termination of a pregnancy is not considered a form of birth control among Greenlanders (as it is in some other countries [Belanger & Flynn, 2009]) nor is abortion viewed as a desirable pregnancy outcome (Montgomery-Andersen et al., 2010). There was significant age-associated variation in the abortion rates in 2009. At 12-17 years of age, 68% of 141 recognized pregnancies were aborted. The proportion was 57% of 238 pregnancies at 18-19 years old, 50% of 535 pregnancies at 20-24 years old, 39% of 418 pregnancies at 25-29 years old, 36% of 325 pregnancies at 30-39 years old, and 46% of 41 pregnancies at 40-49 years old (LAF, 2009).

Contraceptive Use in Greenland. There are very few quantitative data for Greenlanders on the use of contraceptive methods, and virtually none on the reasons for or rates of discontinuation. A 1986 study (Kjaer et al, 1989) of Nuuk women found that about 90% of 20-24 year olds had had their sexual debut before the 17th birthday, but about 20% of this group had never used contraception. Older age groups had similar ages at sexual debut but, reflecting use in adulthood, the never-use rate fell to <10% among 30-34 year-olds. IUD and oral contraception (OC) ever-use rates in the whole sample were about 73% and 51%, respectively. Although seemingly high, there were no data on discontinuation rates and reasons. Condom ever-used rates were only 18%. A later study of young adults (Kjaer et al., 1991) found that only 29% of males and 24% of females reported consistent or "most of the time" condom use. The most recent data (Gabhainn et al., 2009) suggest a substantial increase in condom use in 15 year-olds (63% of girls and 75% of boys reported using a condom at last intercourse), but there appear to be no recent data for older age groups nor for other methods. It is unknown whether condom use in these youths subsequently changed. Bjerregaard et al. (1996) compared 82 Disko Bay women seeking an abortion and 175 women planning to continue their current pregnancy. Those seeking an abortion were more likely to be single, more likely to be unemployed, and had more often been previously pregnant (and had had more abortions and births). Half of these women reported that they had forgotten to use their contraception and 25% opposed the use of contraception. It is plausible that such forgetting and/or opposition are consequences, at least in part, of negative experiences with the use of hormonal contraception, but this hypothesis remains to be tested. The only readily available data on discontinuation comes from the 1986 study in Nuuk (Kjaer et al., 1989): 69% of OC users had used this method for <2 years. The data as reported preclude knowing whether the median duration was nearly two years or only a few months.

Hypothesized Factors Underlying Reproductive Choices and Abortion Rates

PDG utilizes the human ecosystem model of health to conceptualize and examine the hierarchy of individual, social, cultural and environmental factors influencing reproductive decision making among Greenlanders (Bronfenbrenner 1979; Hancock 1985.) Informed by this model and based on studies from other countries, there are several plausible hypotheses for the high abortion rates and other characteristics of reproductive choice in Greenland.

Hypothesis 1 posits that individual characteristics (e.g., age, gender, mental health, alcohol use, spirituality, personal attitudes and beliefs about sex, pregnancy, adoption, and abortion) influence reproductive decision making in Kullorsuaq. Our previous work (Gesink et al., 2010) found that Greenlanders in their teens and early twenties are comfortable with being sexual but lack the self-confidence and skills to communicate with their sex partners about condom use, and that depression and alcohol use can lead to unprotected sexual intercourse and multiple sex partners. These dynamics may create situations in which they have sex that was not anticipated. Greenlandic women have fluid and flexible attitudes towards pregnancy, abortion and adoption (Navne 2008; Montgomery-Andersen et al., 2010).

Previous studies with indigenous populations in the U.S. and Canada also suggest that physical, mental, emotional and spiritual well-being influence sexual and reproductive health. The concept of the physical body in these cultures requires an appreciation of how the interplay between physical and mental

health may affect engagement in behaviors that could lead to unwanted pregnancy (Wingood et al. 2002; Dapice, 2006; Nelson & Gordon-Larsen, 2006; Hellerstedt et al., 2006). Depression, stress, anxiety and post-traumatic stress disorder have also been examined in relationship to sexual risk taking behaviors among indigenous populations. These studies have found that young people from native communities who report high levels of mental health issues are more likely to engage in sexual risk taking behaviors and less likely to consider contraceptive use to prevent unwanted pregnancies than their Caucasian counterparts (Rink et al., 2012a; Garwick et al. 2008; Kaufman et al., 2004; Kaufman et al., 2007; Silmere & Stiffman, 2006). A sense of spirituality has been shown to function as a protective factor buffering some indigenous people from engaging in high-risk sexual behaviors, but has not been investigated as a sexual risk factor in Greenlandic communities (Kaufman et al., 2007; Garwick et al. 2008; Gesink et al., 2010).

Hypothesis 2 posits that interpersonal dynamics between partners in sexual relationships may be influencing reproductive decision-making among men and women in Kullorsuaq. In many indigenous cultures, the role and behavior of a person in a relationship are influenced by social and cultural norms that are passed down generationally (Deloria, 1999, 2003; Voget, 1995; Ehrlich, 2001; Jorgensen, 2008). In Greenlandic culture, both partners in a heterosexual relationship play a role in deciding to use contraception. Type, duration, degree of commitment, and power dynamics in the relationship as well as the individuals' communication skills and reaction to contraception have been shown to influence reproductive health (Harvey et al., 2006; Harvey & Henderson, 2006). Results from *Inuulluataarneq* suggest that contraception use and condom use in youths vary with duration of the relationship. Steady sex partners are less likely to use birth control than non-steady partners. These findings are similar to those in Native American populations in Montana, i.e., birth control is less likely to occur over time if two people are in a committed relationship (Dick et al., in revision; Rink et al., submitted 2012).

Hypothesis 3 posits that there is an unmet need for contraception. If contraception is difficult to obtain (e.g., prohibited, in short supply, logistic and/or cost barriers), abortion may be the only option for averting an unplanned birth. Greenlandic healthcare services are, however, cost-free and widely available (every community has an accessible health center). Nationwide, an array of contraceptives (e.g., condom, IUDs; diaphragm, cervical cap, hormonal pills, injections, and implants) are offered. Although not all options are stocked continuously at every health center, any method can be obtained upon request. Typically, a new contraceptive user requests that method being used by a family member or friend, or she relies on a health provider's advice. While it appears that contraception per se is *not* difficult to obtain in Greenland, potential users may perceive barriers that are not overcome by the availability of cost-free methods at local health centers. For example, if centers are staffed by other community members, it may be uncomfortable for some clients (especially younger ones) to request contraceptives from someone known personally to them. Meldgaard (2004) noted a preference among young Greenlanders for condoms to be more widely available in locations frequented by young people and to be more attractive (e.g., colored). Even if easily accessible, it may be that the available methods are not well suited to some clients' needs.

Hypothesis 4 posits that contraceptive mismatches may arise from cultural perceptions and/or behavioral norms that hamper correct and consistent use of some methods. For example, ongoing studies at The Kinsey Institute have found that many sexually active U.S. males and females do not use condoms correctly or experience problems when using condoms that interfere with consistent and correct use (Crosby et al. 2002, 2003, 2008b; Sanders et al. 2003; Yarber et al. 2005). The literature from 14 countries (Sanders et al., 2012) suggests that condom-use errors and problems are prevalent globally; these authors urged more assessments in more diverse populations of the sources of errors and problems in condom use. The fit and feel of condoms, and concerns about interference with arousal, may also lead to inconsistent or incorrect use and/or condom breakage or slippage (Crosby et al. 2004, 2007, 2008a, 2010; Graham et al., 2006, 2011; Reece et al., 2008; Yarber et al., 2007b). Condom use errors and problems appear to arise, at least in part, from pervasive cultural mores that discourage the open discussion of sex, and from widespread cultural beliefs that men will "naturally know" how to use condoms, that explicit instruction and practice before sexual encounters are not needed, and that one size fits all; to the contrary, in U.S. men, training and solo practice using a wide variety of condoms increases client satisfaction with this method (Yarber et al., 2007a). In 15-year-old Greenlanders, condom use is common (Gabhainn et al., 2009), but there are no published data on method satisfaction or discontinuation. However, recent results from *Inuulluataarneq* suggest that condom use is discontinued quickly in a relationship (within days or weeks of initiating sexual intercourse) because they perceive a high level of trust with their sex partner. In 12-17 year-olds, the high pregnancy rates (16% of all pregnancies in 2009)

and abortion rates (68% of those pregnancies) suggest there may be unrecognized cultural perceptions and/or behavioral norms that influence correct and consistent use of condoms or other methods.

Hypothesis 5 posits that familial relationships, which are a reflection of cultural values that link kinship and trust, are influencing pregnancy choices and outcomes in Kullorsuaq (Montgomery–Andersen & Borup 2012 accepted). *Inuulluataarneq* revealed that high-risk sexual behaviors, which may lead to unwanted pregnancies, are influenced by family patterns of communication and social modeling of intimate relationships (Rink et al., 2011). Personal responsibility was identified as an important element in sexual decision-making. This was interconnected to the concept of place: a person's birthplace and family's home community is at the core of a person's identity (Nuttall 1992). The concept of collectiveness, of forming a group together, is an essential feature of Greenlandic culture that acts to reinforce a personal responsibility to the whole family and community (Nuttall 1992). Thus, in sexual relationships, Greenlanders assume that a sexual partner is being personally accountable for her/his own behavior. Furthermore this expectation of personal responsibility underpins expectations of trustworthiness in relationships. The individuals perceive that they know each other on an intimate level because of the familial and community cohesiveness in Greenlandic culture (Rink et al. 2011). Trust is thus a precursor for individuals to move quickly into a sexual relationship. This sense of trust may not promote birth control or condom use, which may lead to unplanned pregnancy.

In addition, in Greenland we have found that not only sexual partners, but also other family members can play an important part in reproductive decisions (Montgomery-Andersen & Borup, submitted). Women's decision-making regarding the eventual outcome of a pregnancy (e.g. abortion, motherhood, or adoption) is influenced by collective decision making within the family (Montgomery-Andersen et al., 2010). Greenlandic kinship and family relationships are complex networks that include biological ties, social relations, and soul-name practices (Trondheim, 2010). For example, in Greenland a newborn is typically given the name of a recently deceased family member in order to retain that family's connection to the deceased. The practice of naming is flexible and establishes relatedness between individuals, families and communities. Reproductive decision making may be influenced by who is currently a part of one's family and who has died, and may not be solely the decision of the pregnant woman and/or her partner. *Inuulluataarneq* revealed the association between Greenlandic community cohesiveness and individual self-confidence, determination, and reproductive health care seeking behaviors. In more cohesive communities, young people are more willing to seek reproductive health services and are motivated to be sexually healthy than in less cohesive communities (Rink et al., 2012a; Rink et al., 2012b). Research conducted with U.S. Native American populations also found that community connectedness and the resources inherent in the structure of a community influence young peoples' sexual decision making (Jervis et al., 2006; Smylie et al. 2006). Other research with native populations has emphasized the importance of immediate and extended family involvement in order to understand how modeling, verbal and non-verbal communication and body language within a social and cultural context influence family dynamics (DuBray & Sanders, 1999; Locke, 1992). The intricate pattern of kinship and family dynamics in Greenlandic culture may be influencing pregnancy outcomes.

Hypothesis 6 posits that features of natural and built environments, the climate changes occurring in the environment and its influence on hunting, as well as the increased oil industry in the area may be influencing pregnancy outcomes in Kullorsuaq. There is a growing body of research suggesting that "place-based" understandings of health and well-being are linked to social, cultural and psychological factors (Luginaah & Reutter, 2005; Wakefield et al, 2001). As stated above, research conducted in Greenland and other Arctic populations has shown that place is central to a person's identity, their emotions, their respect of their culture and traditions, self-esteem and self-efficacy and their feelings of connection to their environment (Jardine et al., 2009). Thus externally introduced changes to a place may be disruptive and cause anxiety and/or depression in populations with a place-identified culture. Connection to the land, the sea, the weather, and seasonal variations in light are central factors in the psychological well being of many Greenlanders (Malaurie, 1985; Ehrlich, 2001; Jorgensen 2008). For many Greenlandic communities, particularly those above the Arctic Circle, the health of both individuals and communities are directly related to the quality of the ice during winter and spring and the numbers of whales, seals, musk ox, reindeer, polar bears and fish for hunting, all of which have undergone significant changes because of global climate change, resulting in a decrease in traditional foods intake, changes in lifestyle and a reliance on western foods and lifestyle practices (Norris, 2010). Furthermore Greenland has considerable natural resources including offshore oil deposits that are currently under exploration in

the Kullorsuaq region. This development may have a considerable impact on the region's environment, not to mention economic and lifestyle changes for the people of Kullorsuaq ([Government of Greenland, 2012](#)). In addition, results from *Inuulluataarneq* suggest that certain built environments, such as urban settings, low income housing, and situations in which multiple people shared one living space, were associated with depression and alcohol use, which in turn was associated with engagement in high risk sexual behavior (Gesink et al., 2010). Previous research supports a correlation between individuals' perceptions of their natural and built environment and potential engagement in problem behaviors such as high-risk sexual activity, which may lead to unintended pregnancy (Perkins et al., 1998; Stiffman et al., 2007; Portman & Garrett, 2006; Gesink et al., 2010). We suspect that sense of place, and aspects of the changing natural and built environment, are influencing reproductive decision-making in Greenland.

Summary. Fertility and population growth in Greenland are low, patterns that have understandably engendered concern over population sustainability. Today, even though a wide array of contraceptives are cost free and appear to be widely accessible, the abortion rates are exceptionally high, especially among younger women. Data on contraceptive use and discontinuation, on experiences with methods, and on related social, cultural and environmental influences are essential to addressing the reproductive health needs of Greenlanders. Using a community based participatory research framework and qualitative and quantitative methods of inquiry this project will gather the data necessary to elucidate the factors that may be influencing reproductive choices among Greenlanders. Thus Kullorsuaq provides the opportunity for a comprehensive examination of reproductive decision-making in an isolated, largely closed and youthful community.

Methods and Procedures

Study Area. Conversations with Greenlandic policy leaders and health care stakeholders regarding this project began in 2009 and were followed by meetings in 2010 with government personnel in the northern municipality that oversees public health matters in Kullorsuaq. Discussions in 2011 and 2012 with government and health care personnel and community members in Upernavik and Kullorsuaq helped to identify community partners and appropriate time periods for working in Kullorsuaq given the project objectives and the challenges of Greenlandic weather. Upernavik is the closest large city to Kullorsuaq with substantial ties through the health care system, economy and transportation. Any work in Kullorsuaq involves travel through Upernavik and collaboration with regional community agencies. Funding was sought and received from the Greenlandic National Research Council to continue the capacity building with Kullorsuaq and begin pilot testing of data collection instruments.

The process that we plan to implement in Kullorsuaq is similar to that undertaken by Rink and Montgomery-Andersen in *Inuulluataarneq*: an iterative cycle that generates understanding between the research team, policy leaders, health care stakeholders, government personnel and community members (Rink et al., 2012 accepted). This interactive revisiting of project plans, project logistics, who to work with and how to work within a community mirrors other work that Rink has conducted with indigenous populations in rural Montana. Stakeholder investment and community support for a research study requires capacity building with political leaders, government personnel and tribal members (Christopher et al., 2011). Building capacity, developing partnerships, and collective, interactive and iterative decision making are central to CBPR and inherent in the ways Arctic indigenous cultures tend to process information, make decisions, and take action for the good of the group as a whole (Nuttall 1992).

Sampling Strategy. There are an estimated 125-150 women ages 15 to 49 living in Kullorsuaq. Interview data will be collected from 50 women and their 50 male partners. Women and their male partners who are between the ages of 15 to 49 years old and living in Kullorsuaq will be eligible to participate in the study. In addition, eligible participants must have had at least one sex partner over the past 3 months. The participants will be recruited for this study using purposive sampling techniques. Based on lessons from *Inuulluataarneq*, research participants will be recruited through: 1) announcements at established community meetings and organizations; 2) word-of-mouth; 3) flyers; and 4) information provided to women and men seeking reproductive health services at the Kullorsuaq health center.

Research Activities and Timeline. PDG comprises four phases over a 4-year period.

Phase I (2013-14) is a preparatory stage that we will undertake during the year *before* the funding from NSF would begin (funding period for this proposal is May 2014 - April 2017). Based on experience with *Inuulluataarneq*, it's important to allocate a year or two of planning prior to intensive data collection because of Kullorsuaq's remoteness, weather patterns and subsistence activities, and the inherent obligations of taking a CBPR approach. During 2013, we will begin to formalize the Community Advisory Board (CAB) and continue discussions with community members and policy makers regarding the project's logistical and research needs. Trøndheim and her graduate student will begin an ethnographic study (described below) that will continue through 2014. We will also request and confirm Institutional Review Board approvals from all appropriate universities and agencies.

During *Phase II* (2014-15), in collaboration with the CAB, we will discuss findings from the ongoing ethnographic study, develop recruitment strategies, design interview instruments, and fine-tune logistics of biological sampling. Students from Montana State University (MSU) and the University of Greenland (UG) will be recruited for internships. We will finalize all IRB approvals.

During *Phase III* (2015-16) we will implement data collection protocols (described below) with study participants who have given informed consent, identify practice and policy strategies that influence reproductive choices in Greenland, and initiate evaluation of the project's CBPR component.

During *Phase IV* (2016-17), we will focus on the synthesis and dissemination of the project results to the Greenlandic community. This will include the preparation, analysis and interpretation of the data with the CAB, as well as presentation of results at community meetings, in workshops and seminars with people in Kullorsuaq. Focus groups will be conducted with policy makers and health system leaders to share research results and identify recommendations for improving reproductive health in Kullorsuaq and nationwide. We will also prepare papers for presentation to the scientific community and publication in scientific journals.

Research and Evaluation Strategies

Data Collection and Analysis. We will use the following data collection methods to address the study's research hypotheses: 1) Ethnographic interviews and observations in Kullorsuaq; 2) In-depth qualitative interviews with 50 women and their current partner; and 3) Focus groups with policy makers and leaders in Greenland's reproductive health system. The integration of the data generated by these methods is expected to yield a robust and comprehensive understanding of the complex factors influencing reproductive decision-making in Kullorsuaq specifically and in Greenland more generally. Community outreach workers from Kullorsuaq will assist respondents in the reporting of data. Selection of these interviewers will be based on their ability to implement the research protocols and adhere to confidentiality. The researchers will train the community outreach workers in the study protocols and protection of human subjects. Students from the U.S. and Greenland also will assist in data collection.

Ethnographic Interviews and Observations. An ethnographic study will be conducted of Kullorsuaq and the surrounding area in order to become familiar with the community and the contexts in which the inhabitants pursue their daily lives. By using ethnographic tools it is possible to gain understanding of the reasoning behind a population's decisions and beliefs (Spradley 1980). In reproductive research, ethnographic interviews can bring the participants closer to understanding the happenings related to and evolving from their reproductive decisions. Through the use of participant observation and ethnographic interviews the experiences of participants take on a new form and become visible for the researcher (Riessman 1993). Researchers participate both actively and observationally, and collect data that can highlight the people's daily life and its influence on their decisions (Hammersley & Atkinson 1995). In order to unravel these stories and make them accessible to others, it is necessary to develop a conceptual context using analytical tools that strengthen the stories rather than weaken them (Delholm-Lambertsen & Maunsbach 1997). The ethnographic study will include observations and open-ended conversations with community members regarding access to contraception and family planning services, family dynamics, characteristics of sexual relationships, the process of naming in Kullorsuaq families, adoption, gender roles, concepts of place and how place influences one's sense of self and one's decisions to have children, particularly given escalating climate change and the new oil industry in Kullorsuaq. Ethnographic interview results and notes from community observations will be discussed with the research team and the project's CAB for further insights.

In-depth Interviews. Interviews on topics related to reproductive choices will occur one-on-one for 1 to 2 hours. Study participants will be compensated for participation in this interview. The interview instrument will be developed and refined during Phase II, in partnership with the project's CAB. In *Inuulluataarneq* we successfully used cognitive interviewing techniques, which include discussing the questions and the interview guide itself, and will use this process to refine and pilot test the interview protocol (Davis et al., 1998; Gesink et al., 2010; Rink et al., 2012 accepted). All questions will be open ended in order to build on Greenlanders descriptive means of communication, which emphasizes discussing situations and telling stories. It is anticipated that the in-depth interviews, collaboratively designed by the CAB and the research team, will include discussion of the following topics: 1) a person's life history and reproductive history; 2) mental health including depression, stress, and alcohol use; 3) spirituality; 4) kinship ties and connectedness to people and places; 5) family relationships; 6) history of contraception and condom use; 7) attitudes and beliefs about sex, pregnancy, and abortion; 8) communication about sex and contraception use with sex partners; 9) relationship dynamics with sex partners; 10) Greenlandic practices of adoption and naming; 11) how the natural environment (e.g. weather patterns, hunting, seasonal variations in light) and built environment (e.g. housing, oil exploration, transportation) influence life style choices which may in turn affect reproductive decision making.

In-depth Interview Analysis Plan. Qualitative data will be analyzed using content analysis techniques (Holloway, 1997). Coding transcript texts involves two stages. First, a topical indexing scheme will be developed to identify the text pertaining to particular topics. Software (NVIVO 7, QRS International, Cambridge, MA), will be used to construct and organize a topical indexing system of codes identifying sections of text that capture the central concepts of interest. The researchers, the community outreach workers and the community advisory board will identify specific themes within central concepts and collaborate in two equally important processes: representation (systematic presentation, coding and categorization of the text) and interpretation (use of theory to analyze and present the text). Categories will be developed together with the CAB and then all text will be individually coded pertaining to the specific topic (Rhodes et al., 2007). The representation process will include testing reliability, coding reproducibility and accuracy, examining validity between concepts, variables and methods, validity of classification schemes and finally the creation of and testing of coding schemes. Coding will include defining categories, test coding, assessment of reliability, revision of coding rules and/or evaluation of accuracy in coding. Once the data are coded, the themes and patterns will be summarized and brought to the CAB to be interpreted together with them. Coded text will be used to identify illustrative quotes from the interviews that will help to invoke the richness of the spoken language.

Data analysis for *Inuulluataarneq* began with data compilation by the research team which then shared the data results (e.g., bar charts of frequency distributions for each analyzed variable) with the CABs for *Inuulluataarneq*. Analyses of the results were completed over two 1.5-2 hour meetings with the CAB members in which they reviewed and discussed the visual representations for each variable. The CABs then discussed the results to provide further context and insights into the research results and recommendations for addressing sexual health with Greenlandic youth and their parents. We anticipate that a similar process will take place with *PDG* in which the research team compiles the results and then provides visual representation of the data to be discussed and analyzed for meaning.

Focus Groups. Five focus groups will be conducted with 5 to 7 policy makers and key leaders who are involved in Greenland's reproductive health system. Focus groups are used to facilitate a discussion about a particular topic that emphasizes the interactions of the participants (Berg 2001). The intent of the focus groups will be to stimulate new ideas and attitudes for leaders and policy makers in Greenland on reproductive health policy, education and services. It is anticipated that focus groups will take place in Nuuk (Greenland's capital and home for national policy makers), Ilulissat (main city of the municipality that includes Kullorsuaq and home to regional government agencies), Upernavik, and Kullorsuaq. Each focus group will last 1-1.5 hours and will review the project's findings and discuss recommendations for improving the reproductive health outcomes of Greenlanders. Content analysis will be conducted on the focus group transcripts using the same process as the in-depth interviews described above.

CBPR. In our work with *Inuulluataarneq* we found that there are few documents on adapting CBPR best practices to cultural groups in the Arctic or that examine the effectiveness of these adaptations (Rink et al., 2009; Rink et al., 2012 accepted). The research team will work as equal partners with key stakeholders in Greenland and community members in Kullorsuaq to follow a series of overlapping and iterative CBPR

activities: 1) information gathering with community stakeholders and community partners; 2) information synthesis with stakeholders and community partners; 3) developing goals of the study that meet community and researcher needs; 4) designing an evaluation plan with community partners to assess the effectiveness of the study's work in Greenland; 5) data collection and feedback with the communities regarding the data results; 6) developing a plan for dissemination of the study results; and 7) reviewing study progress (Isreal et al., 2001; Shore, 2006; Minkler, 2004). Attention will be given to creating a culturally relevant process that adheres to Greenlandic culture and practices. During data collection and analysis, the research team will meet regularly with CAB members to discuss the project. At each meeting, community members will be given the materials necessary to have input into the project (e.g., copies of data collection instruments, transcripts, the results of data analysis) for their review and comment. The research team will work with the CAB to determine how and to whom to disseminate the research results. CAB meetings will also include discussions on how to apply the project's results to future educational reproductive health strategies and policy development related to reproductive health policy in Greenland. Other projects using CBPR approaches have successfully followed this model (Isreal et al., 2005; Minkler & Wallerstein, 2003; Viswanathan et al., 2004).

IRB Approvals & Data Management. IRB approval will be obtained from Montana State University (MSU) and the National Ethics Committee of Greenland (NEC); research protocols for data management will be solidified with members of the research team, the CAB, key stakeholders and health system officials. Preliminary approval for community capacity building has been obtained from MSU and NEC. Please see the submitted Data Management Plan for further information.

Potential Challenges and Limitations. Challenges to recruitment and data collection need to be considered. Recruitment of participants may be laborious as men and women may not be comfortable talking about their reproductive decision-making. Retention of the research participants due to mobility may be a challenge. The project's timeline will need to accommodate the summer months when there is a significant amount of participation in hunting, traveling, sailing, and berry picking, which can take people away from their communities for extended periods of time. Limitations that may influence the study results include: 1) The in-depth interview data will be based on self-report, which may be restricted to opinions or feelings rather than facts or evidence; 2) Ethnographic observations are made through the eyes of the researchers and may be limited in their accuracy; and 3) Although the CBPR framework is well established and increasingly used when conducting research with indigenous communities in the United States and Canada, and the research team has experience implementing the first CBPR project in Greenland, it is still a new research methodology for Greenland which may need adjusting to meet social and cultural norms. To meet these potential challenges and limitations, all issues will be discussed by the members of the CAB and the research team. Appropriate strategies will be developed and put into effect.

Research Team. The primary researchers for *PDG* are described below.

Elizabeth Rink—Principal Investigator. Rink is an Associate Professor at Montana State University. She has worked for the past 10 years on community-based projects that address sexual and reproductive health. In addition to *Inuulluataarneq*, she is the principal investigator for a 5-year study on men's sexual and reproductive health with the Fort Peck Tribes. Dr. Rink is also the primary investigator for the *Ceremony of Research*, a three year NIH-funded project with the Fort Peck Tribes to build the tribe's research infrastructure. Evidence from Rink's research with indigenous populations in Montana and Greenland suggests: 1) Indigenous women and especially men are not receiving adequate reproductive health services; 2) Experiences with historic trauma, mental health, community norms regarding sex and pregnancy, and the isolation of the natural environment are influencing pregnancy outcomes; and 3) Relationship factors such as length of time in an intimate relationship and perceived level of commitment influence sexual health. Rink will be responsible for the design and implementation of the in-depth interviews and focus groups, the CBPR aspects of the project, and oversight of project management by the University of Greenland.

Gitte Trøndheim—Co-Investigator. Trøndheim is an Associate Professor at University of Greenland and Head of the Department of Cultural and Social History. Trøndheim's areas of specialization are in cultural and social anthropology focusing her research on kinship, gender, urbanity and identity. Trøndheim's research on Greenlandic kinship has sought to illuminate and explore the understanding of the importance of modern kinship and family in Greenlandic towns. Trøndheim's work demonstrates that the

Greenlandic family has undergone significant changes from the perspective of urbanization and individualization and that family life now is much different from that of the Greenlanders' forefathers. Trøndheim has collected ethnographic data on adoption of children and on Greenlandic naming; both systems are deeply rooted in the Greenlandic traditional way of life. She is also a member of the Academic Council of the University of Greenland as well as the Nordic Centre for Spatial Development. Trøndheim will lead the ethnographic component of the study.

Intellectual Merit of the Proposed Project

PDG will take an innovative and comprehensive approach to examining the personal, sociocultural and environmental determinants of sexual and reproductive health in Arctic populations. The intellectual merits of this project include:

- 1) a greater scientific understanding of how reproductive decision making is affected by cultural values and social norms interacting with other personal and environmental factors;
- 2) greater insight into males' perspectives on reproductive choices, which have been given relatively little attention in previous research on reproductive decision making;
- 3) utilization of CBPR to ensure the study is designed, implemented and evaluated in a culturally relevant manner with respect for and incorporation of Greenlandic expertise and knowledge.

The research team is hopeful that *PDG*'s comprehensive research design will encourage similar approaches in future sexual and reproductive health research in the Arctic.

Broader Impacts of the Proposed Project

- 1) *Advance Discovery and Understanding While Promoting Teaching, Training and Learning.* *PDG* will provide experience and training for students in the United States and Greenland in the skills, techniques and knowledge needed to carry out community based participatory research on reproductive health in Arctic communities. The students will be involved in all phases of the research (e.g., assisting the CAB and data collection in Kullorsuaq, analyzing data and presenting results to local and academic communities and co-authoring papers).
- 2) *Broaden Participation of Underrepresented Groups.* *PDG* will create a dialogue and build connections between institutions in the United States and Greenland to foster a greater understanding of the importance of the connection between the multiple layers of the human ecosystem model and reproductive health in a declining Arctic population. Montana State University is an EPSCoR institution and proactively provides educational opportunities to underrepresented groups, specifically Native American students. Trøndheim at the University of Greenland will also have opportunities to enhance research skills and capacity among under-represented U.S.-based and Greenlandic students.
- 3) *Broad Dissemination to Enhance Scientific and Technological Understanding.* We will present the results of our work at international conferences, specifically those that relate to social science research in the Arctic, and publish our findings in peer reviewed journals. Our results will be disseminated to local government officials, public health officials, and medical practitioners in Greenland.
- 4) *Benefits to Society.* *PDG* will raise awareness about CBPR methods and the interplay of social, cultural and environmental factors and physiology that impact reproductive choices in Greenland. These factors are complex and multi-dimensional. The country's high rate of abortion and low birth rate are a concern for the overall health and well-being of the society and culture. We will share information for policy formation with Greenlandic agencies and the health system so as to address the country's abortion rates and overall reproductive health. *PDG* will broaden Greenlanders' skills to conduct or engage with social science and anthropology research that can be analyzed, interpreted and synthesized with a Greenlandic way of knowing and thinking. This will be useful to the country's educational and health systems, and to future researchers wishing to conduct social science research with Greenlanders.

Below is a description of the activities accomplished during Year 1 of PDG.

Activity 1. Establish a CBPR framework for a social science study of reproductive health in Greenlanders.

Objective 1a: Establish a community advisory board in Kullorsuaq to provide oversight and guidance on the project.

Objective 1b: Through monitoring of process and outcome variables, evaluate the strengths and the challenges of CBPR as a conceptual framework for conducting social science research in Greenland.

1a: A three member community advisory board (CAB) was established, including two men and one female between ages 30 and 48. Based on continued discussions with the CAB by the research team it has been agreed that in Year 2 the CAB will be expanded to include one to two elders and one women in her 20s so that the project can have a range of perspectives regarding the research.

1b: Dr. Rink (MSU) has been conducting CBPR studies in Greenland since 2007.

CBPR continues to be an effective framework for conducting social science research in the Arctic. During the first year of PDG similar challenges were encountered that Dr. Rink had encountered during the capacity building stages of her research with other Greenlandic communities in that community members in Kullorsuaq were not familiar with CBPR and were unsure of their role with the research study. Because of this during field work trips to Kullorsuaq in 2013 and 2014 Dr. Rink, Gitte Trondheim (UG) and project coordinator Kristo Lyng-Pedersen (UG) met several times with the CAB members in order to discuss their roles and responsibilities. The CAB members were very helpful in Year 1 with reviewing data collection instruments and providing recommendations for who to speak with in the community and how to network with community members. It is anticipated during Year 2 that the CAB members will continue to be actively involved in the research study especially since they are becoming more accustomed to how CBPR studies work.

Activity 2. Examine the individual attitudes, beliefs and psycho-emotional factors, and the social, cultural and environmental factors that appear to have the greatest influence on reproductive choices.

Objective 2a: Conduct ethnographic interviews and observations to understand how reproductive decision-making is determined by social, cultural and environmental factors.

Objective 2b: Conduct in-depth interviews with women and men to identify which of these factors most significantly influence their reproductive choices.

2a and 2b: PDG ethnographic interviews and observations have been conducted by Drs. Gitte Trondheim and Elizabeth Rink. Dr. Trondheim conducted 16 in depth interviews with men and women in Kullorsuaq regarding kinship, marriage and adoption, and is in the process of translating and transcribing these interviews into English for analysis. Dr. Trondheim conducted her field work in Fall 2013 as part of the one year no cost extension for Inuulluataarneq, previously awarded to Dr. Rink, and during 2014 began the transcription, translation and analysis of her interviews. Dr. Trondheim's interviews suggest that kinship networks are a driving force in who people marry, who has children within a family and what happens to a child after it is born (e.g. stays with birth family or is adopted into an extended family). In addition Dr. Trondheim's interviews reveal that kinship networks in Kullorsuaq are established based on who families hunt and socialize with which is different from her previous research in more urban communities in Greenland which has found that kinship networks are established through where and who people work with. Dr. Rink conducted 23 interviews with men and women in Kullorsuaq regarding the influence of the natural and built environment on physical and mental health and reproductive decision making. These interviews are currently being translated and transcribed into English for analysis. These interviews have revealed the relevance of the natural and built environment for population dynamics. They suggest that climate change effects are generating chronic low-grade stress, anxiety and

depression that is influencing mental health and consequent decisions that affect population dynamics, hopes for the future, and plans for families.

2c: Objective 2c is planned for Year 3 of PDG. It is important to note that during the first year of PDG as well as the three years leading up to PDG, when the research team was trying to get the research study funded, Drs. Trondheim and Rink held multiple meetings with key leaders in the Greenlandic health care system, social service system, academics and administrators at the University of Greenland and the Nature Institute and with leaders in the Greenlandic Home Rule. Specifically during June 2014 Drs. Trondheim (UG), Bird (MSU), Rink (MSU), as well as Kristo Lynge-Pedersen (UG) held 10 meetings over the course of five days with the Aforementioned institutions to discuss PDG. In order to implement Activities 1 and 2 MSU took the lead throughout Year 1 to coordinate research team meeting conference calls as well as participating in multiple calls separately with Kristo Lynge-Pedersen to coordinate the project activities.

Activity 3. Examine contraceptive use and discontinuation, experiences with method use including side effects, and variation in endogenous hormone levels and the factors that generate such variation.

3a: Concurrent with the interviews in Activity 2, assess the barriers and facilitating factors that influence non-hormonal contraceptive use (e.g., condoms, withdrawal, vasectomies) among men.

3b: Similarly assess the barriers and facilitating factors that influence non-hormonal (e.g. condoms, diaphragms, IUD) and hormonal (e.g., pills, injections) contraceptive use among women.

Activity 4. Mentor U.S. and Greenland students in CBPR methods and reproductive health research.

4a: Train and supervise student interns as they collect and/or analyze data from the ethnographic observations and in-depth interviews.

4b: Assist these students in developing international personal/professional networks and collaborate with them to articulate (e.g. in a paper or conference presentation) the lessons learned from their work.

4a-b: One female Greenlandic student has been working on her Master's degree at the University of Greenland on educational goals and challenges for young people in Kullorsuaq. One male Greenlandic undergraduate student served as a translator for Dr. Rink during her Fall 2014 field work in Kullorsuaq. At present, four female Greenlandic undergraduate students are assisting with transcription and translation of the Fall 2014 interviews.

Activity 5. Provide recommendations to policy makers for improving Greenlanders' reproductive health.

5a: Conduct focus groups with policy makers and stakeholders to discuss and interpret research findings and identify possible actions for improving reproductive health in Kullorsuaq.

5b: Develop and disseminate recommendations to governmental agencies, health care providers, and the larger Greenlandic community for improving reproductive health in Greenland.

5a-b: Activity 5 is planned for Year 3 of PDG. However it can be said that meetings with policy-makers have conveyed that the Greenlandic health care and social service systems and Greenland Homerule are in full support of PDG in Kullorsuaq because of the significant economic and environmental changes happening in Greenland that are having an effect on small settlements. We believe our research will help not only Greenlanders but other arctic communities understand the influence of climate change on multiple issues such as population dynamics, education, infrastructure needs, and economic development. The remote communities in Greenland are feeling the impact of the changing climate and economy the most. Also of relevance to policy development, Dr. Rink was invited with her colleague Dr. Julia Haggerty (MSU Earth Science Department) to the White House Office of Science and Technology Policy to participate in a one day working group on the impact of climate change on mental health and community resilience. Though the workshop wasn't specific to the Arctic, Dr. Rink was able to discuss at length her research in Greenland as it pertains to this topic and was very well received.

One additional personnel change will be to eliminate interpreters to work with Dr. Rink in Year 3. Instead, we will work with Ms. Lynge-Pedersen at a .50fte in order for her to travel to Kullorsuaq, Upernavik and Ilulissat with Dr. Rink for the Year 3 key informant interviews and focus groups which are focused on policy recommendations. Together they will make one trip to Kullorsuaq to tie up and clarify any loose ends from the data collection in YRs 1 and 2 and conduct focus groups on the significance of the findings for sexual and reproductive health improvement, and a second trip to give back all the results and get final feedback. Ms. Lynge-Petersen will also assist similar focus groups and meetings in Upernavik, Ilulissat and Nuuk.

Other achievements:

Dr. Rink during her Fall 2014 field work in Kullorsuaq. At present, four female Greenlandic undergraduate students are assisting with the transcription and translation of the Fall 2014 interviews. One female US student from MSU, Zoe Watson, has been identified to work on her Master's degree research during Year 2 of PDG. She will investigate the role of physical activity and diet in relation to women's reproductive health in Kullorsuaq. It is anticipated that Ms. Watson will publish and present the findings from her research.

Key outcomes include:

1) Establishment of a solid foundation for PDG in Kullorsuaq with the establishment of the CAB and understanding of the study with leaders in Kullorsuaq, Upernavik, Ilulissat, and Nuuk; 2) Establishment of the infrastructure necessary in Kullorsuaq and UG to implement the research study; and 3) Drs. Trondheim and Rink have completed their first round of data collection.

* What opportunities for training and professional development has the project provided?

The CAB has received fundamental training in the principles of CBPR. Continued training in this area is planned for Year 2. PDG has provided professional development for the 5 Greenlandic students that have worked on the project during its first year. Dr. Rink is also scheduled to conduct a two day workshop on CBPR principles and practices in the Arctic this summer with Master's and PhD students from across the Arctic through the a summer program with the Arctic Studies Program through the Thule Institute in Oulu, Finland. Ms. Lynge-Pedersen has received professional development coaching in her position as UG Program Coordinator through regular consultations with Drs. Rink and Bird, and recently due to her work on this project received a fellowship from the Greenlandic Home Rule Government to study English in England for four weeks. She experienced research field work in Kullorsuaq with Dr. Rink learning ethnographic methods and interviewing skills, as well as community organizing and CBPR capacity building skills. Dr. Trondheim has become head of her Institute (equivalent to a Dean in the US); her involvement in PDG, working on an international research team, has assisted her own professional development as a researcher, in particular improving her capacity for conducting collaborative research in English with Americans. As a result she understands the value of interdisciplinary collaborative research and she promotes this through her administrative position. She was a keynote speaker at the Inuit Studies Conference in 2014, presenting about the value of international collaborative interdisciplinary CBPR research with arctic communities. She used PDG as an example in her speech. Dr. Trondheim and Ms. Lynge-Pedersen are two examples of how PDG has built capacity at the University of Greenland for international collaborative research in English with Americans. Dr. Trondheim was appointed in the past year as the Chair of the Greenlandic Research Council.

* How have the results been disseminated to communities of interest?

At present results of the study are not ready for dissemination to communities of interest. However community meetings are held in Kullorsuaq each time a member of the research team travels to Kullorsuaq to conduct field work. Research team members also post their field work objectives on local community boards in Kullorsuaq each time they are in Kullorsuaq in order to keep the community informed of the research project.

* What do you plan to do during the next reporting period to accomplish the goals?

Field work will be conducted by Drs. Rink and Trondheim in the fall of 2015. Dr. Trondheim will continue her ethnographic study on kinship, and Dr. Rink will conduct interviews primarily with couples and families regarding relationship dynamics and sexual and reproductive health and decision-making. In spring of 2016 Dr. Rink will together with project coordinator Kristo Lyng-Pedersen conduct additional interviews that concentrate on mental health factors related to sexual and reproductive health decision-making. Ms. Watson will conduct her field work in spring 2016 as well. During year 2 the team will complete analysis of the interviews conducted in year 1 and submit publications. All of this field work and manuscript preparation will advance Activity 2 and Activity 4. In addition, Dr. Rink will travel to Nuuk in Fall 2015 to meet with key stakeholders and provide them with updates on the project. This will continue the effort for Objective 2c and prepare the way for Activity 5 in year 3 through continued relationship building with policy-makers. As noted above, Dr. Rink will conduct a workshop for the Arctic Studies Program through the Thule Institute in Oulu, Finland on CBPR principles and practices in the Arctic in June with Master's and PhD students from across the Arctic. During the workshop and a visit to Utzjoksi she will explore with Finnish and American colleagues the potential to develop further international CBPR collaborations in the arctic around mental health, population dynamics and climate change.

She has been appointed Chair of a new circumpolar sexual and reproductive health working group with the International Circumpolar Health Association that will be meeting in Oulu as part of the International Congress on Circumpolar Health Conference.