POPULATION HEALTH INITIATIVE
UNIVERSITY of WASHINGTON

Tier 1 Pilot Grant Application: Laying the Foundation
Autumn 2024 Cover Sheet

Project Information
Please provide the following information.

Project Title	Assessing heat-sensitive health risks in the Argentinian Gran Chaco: a multipluralistic approach
Budget Request from Initiative	TBD
Budget Match (if applicable)	TBD
Total Project Budget	TBD

Project Information

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Olga Yegros (Co-Investigator): Director, Namqom Community Health Center

Abstract (250 words)

Project Research Plan (1 page)

Project Aims: Many contemporary South American Indigenous populations have continuously inhabited extreme environments through adaptation and cultural innovation. However, the intersection of colonialism with continued economic marginalization, globalization, and climate change threatens the resilience and well-being of many Indigenous communities[1–3]. In particular, increased exposure to extreme heat may exacerbate health risks for the most vulnerable community members (i.e. infants and young children, adults who are pregnant/lactating, older, and/or have chronic morbidities) [4]. *Multipluralistic* approaches—which recognize traditional and biomedical health practices as complementary and legitimate—may optimally support Indigenous health [5–7], yet have not been widely integrated into investigations of Indigenous perspectives of climate-change and related health impacts[8]. Among ecologically vulnerable Indigenous populations, there is an urgent need to assess heat-sensitive health risks within a framework that promotes multipluralistic health care access and acceptance.

The Toba/Qom are an Indigenous population native to the South American Gran Chaco, a tropical dry forest ecozone with frequently high ambient temperatures (>47°C). Today, most Toba/Qom communities reside in Formosa, Argentina, one of the most rural and economically underdeveloped provinces in the nation, with the most vulnerable provincial health status indices[9]. The Chaco Area Reproductive Ecology (CARE) program has worked with Indigenous communities in Formosa for 27 years, examining cultural, biological, and socioecological dimensions of well-being, including maternal and child health[10–12], cardiometabolic health[13], multipluralistic health practices[5], and climate risks and resilience[14,15]. Most of this work has been conducted in the peri-urban community of Namqom, the largest Toba/Qom community in Formosa (pop. ~ 5000). Following prior collaborations and meetings with the Namqom Health Clinic Director (Dra. Olga Yegros), we propose to conduct a pilot study and community needs assessment to address the following questions: *What is the socioecology of heat exposure and heat-sensitive health conditions (e.g. hypertension, diabetes, adverse pregnancy outcomes) in Namqom? What are cultural perceptions of and strategies for coping with heat and heat-related health risks? What social support systems and therapeutic practices can be better integrated into clinical care and outreach to buffer those most vulnerable to heat-impacted health risks?*

Methods: Field data collection will be targeted to a subsample of approximately 150 community members at high risk of heat-related health impacts: adults aged 65 and older (n = 30), pregnant and lactating women (n = 40), infants and young children (n = 20), and adults with previously diagnosed diabetes or hypertension (n = 40), along with a control sample of healthy, non-pregnant/non-lactating adults aged 25-44 from participant households (n = 20). Surveys and semi-structured interviews will document perceptions of heat and hydration, knowledge of heat-exacerbated health risks, traditional therapeutic practices employed for affected conditions, and general heat coping strategies. Following comparative research conducted in Bolivia and India[16,17], we will also collect minimally invasive biomarkers (hydration status, blood pressure, body temperature) and household temperatures to document heat stress during peak high temperature months. Field data collection will be overseen by CARE Co-Directors Drs. Martin and Olmedo, and led by two experienced Namqom community member researchers: Lisandra Mansanilla (CARE Research Affiliate) and Grecia Romedi (CARE Research Assistant, certified community health outreach worker). Martin and Olmedo will collaborate with Dr. Yegros to digitize clinical health records (kept in paper form) and develop workflows necessary to assess annual changes and seasonal peaks in targeted health risks. They will develop a HIPAA-compliant REDCap database and protocol to securely share and analyze written and electronic patient data from the Namqom Health Clinic, providing additional capacity building and training for Dr. Yegros. Drs. Martin and Olmedo will pursue similar collaborations with other health centers and hospitals serving provincial Indigenous communities.

Tier 1 Project Evaluation Plan (1 page)

1. What are your measures of success for this project? Results from pilot field data collection will be preliminarily analyzed and shared immediately with the Namqom health care center and community in the form of formal reports, community radio discussions, and informational fliers or posters. A report given to the clinic will include actionable steps that can be integrated into patient care and outreach to further promote awareness of heat risks, while incorporating multipluralistic health care awareness among clinical staff. The study will generate databases, procedures for data sharing and entry, and a formal data use agreement with the Namqom Health clinic. and other potential health care partners in Formosa to allow for future expanded data sharing and analysis.

2. *How are you planning to utilize the results of your work to pursue a future project to generate proof-of-concept once the eight-month project is complete?* Results and protocols stemming from this pilot study will inform the aims and methods of future internal and external (NIH, NSF) grant proposals to support longitudinal study of biological and cultural adaptations to extreme heat among a wider sample of Indigenous Chacoan communities in Formosa. The long-term aims are to identify feasible educational and infrastructural interventions to mitigate heat risks in these communities—with emphasis on those that promote or build off of culturally developed protections—and ultimately help to more widely implement and assess the success of any such programs.

Project Timeline: **February 2026**: community meetings, participant and field research assistant recruitment, data collection training and refinement; begin review of clinical records, database construction and data entry protocols for field and clinical data. **March – April 2026:** participant interviews and biomarker collection. **March – June 2026:** clinical data entry; data analysis. **June – August 2026**: Analysis and dissemination of results

Biographies:

Melanie Martin (PhD Anthropology, University of California Santa Barbara) is Co-Director of the CARE project and Co-PI of the UW Biodemography Laboratory at the Center for Studies in Demography and Ecology, where she collaborates and consults on field research methods and analysis for multiple population health studies. She has worked collaboratively with Indigenous communities and local researchers in South America for over 15 years studying maternal and child health, joining the CARE project in 2016. Her field research and project management expertise will ensure successful execution of the pilot study and generation of results for future grant applications.

Sofia Olmedo (Lic. Nutrición, PhD, Ciencias de la Salud, Universidad de Córdoba) is a native Formoseñan who has worked with the CARE program since 2012 as a Research Assistant, Field Coordinator, and now Co-Director. She has led research on child nutrition, water security, and metabolic health in Namqom and other Indigenous communities in Formosa province. Dra. Olmedo's expertise in community-based and mixed-methods research, and her professional associations (U. of Formosa, CONICET) are critical to the implementation of the pilot study, local dissemination of results, and future expansion of the study.

Roberto Orellana (PhD**)** is an internationally renowned global health researcher who has led initiatives supporting Indigenous health and health of underrepresented, high-risk minority groups in the U.S., Mexico, Guatemala, and Peru. He contributes vital expertise in the implementation and execution of community-based and culturally-grounded global health projects, which benefit the proposed study design, execution, and dissemination of results.

Olga Yegros (MD**)** has served as the Director of the Namqom Community Health Center for XX years. She will assist with development of ethical data sharing and analytical protocols, while her collaboration provides critical insight to community challenges, interpretations of results, and development and interpretation of community and clinical interventions.

Budget proposal and justification (1 page)

	Requested from PHI	Funding Match
Salaries (UW)		
Staff (CSDE Statistical consulting @ 80 hours)		
Student RA (100 hours)	$1997	
Salaries (CARE program)		
Co-PI salary stipends	$4000	
Field Team Leaders (2 x monthly salary x 3 months)	$2400	
Field Team RAs (2 x monthly salary x 2 months)	$1200	
Supplies and Materials		
Supplies, equipment under $2000	$3500	$865
Travel & Lodging		
RT airfare Seattle – Buenos Aires	$1,700	
RT airfare Buenos Aires - Formosa	$400	
Lodging Buenos Aires (2 nights)	$250	
Lodging Formosa (1 month, Fundación ECO)	$600	
Research fee (Fundación ECO)	$500	
Per diems	$4228	
Car rental (1 month)	$1000	
Total Direct Costs	**$20997**	

Budget Justification: Travel to/from and travel and lodging in Argentina for one month for PI Martin to oversee study implementation. Research and lodging fees in Formosa are paid to Fundación Eco, a local non-profit organization which coordinates lodging, transport, and other research logistics (e.g. research assistant payments) for the CARE program. Partial salary support for Co-PIs Olmedo and Yegros to assist with and oversee proposed activities. Salaries for field team leaders to train and conduct field data collection over three months, for field research assistant support for two months, and for a Spanish-speaking UW graduate student RA to assist with clinical data transcription and coding.

Requested field equipment will allow simultaneous data collection by two field teams: (2) interior temperature monitors (Kestrel 5400, $529/ea) and wearable temperature monitors (Kestrel K2 DROP, $99/ea) to measure participant heat exposures; (2) urinary specific gravity refractometers (Atago 4410, $669/ea) to measure hydration status; consumables for collecting urine samples (gloves, disposable pipettes, and collection cups, $200 total); (2) extra-large arm cuffs for upper arm blood pressure monitors (Elera, $18/ea). The CARE program maintains a policy of refraining from individual participant compensation due to past unintended consequences (creating distrust and perceptions of favoritism between participants vs. non-participants, with payments wrongly attributed to political or government involvement). Instead, CARE program researchers contribute goods (e.g. food, supplies) to community events (costs subsumed within per diem).

The Center for Studies in Demography and Ecology will provide in-kind matching support in the form of loaned field equipment from the Biodemography Laboratory (2 body composition scales and 2 upper arm blood pressure monitors, total equipment value $865) and 80 hours of statistical support from CSDE scientific staff to assist with REDcap database construction and statistical analysis.

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