

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

1. CONTACT INFORMATION – PRINCIPAL INVESTIGATOR(S)

See GSK ERI Guidelines for details of what to include in each element. **Italicized** rows may be copied directly from the previously approved Letter of Intent (LOI) unless information needs updating or further detail as described in the Guidelines.

Principal Investigator			
	(Last)	(First)	(Middle)
Name	Knaul, Felicia Marie		
Title(s) & Position(s):	<p><i>Researcher, Senior Economist and leader in the LAC Health Observatory, the Health and Competitiveness Program, Health Economics Analysis Unit and the Multi-country study of Financial Protection and Health System Finance in LAC, Fundacion Mexicana para la Salud (Funsalud – Mexican Health Foundation)</i></p> <p><i>Director of the Harvard Global Equity Initiative (HGEI) and Associate Professor at the Harvard Medical School; HGEI is Secretariat of the Global Task Force on Expanded Access to Cancer Care and Control in Developing Countries.</i></p> <p><i>Founding Director, Cáncer de Mama: Tómatelo a Pecho (Breast Cancer: Take it to Heart), a program dedicated to undertaking and promoting research, advocacy, awareness and early detection initiatives in Latin America. Tómatelo a Pecho is currently based at Funsalud and being converted into an independent NGO.</i></p>		
Institutions/Affiliations: (including Supervisor)	<p>Mexican Health Foundation, Mexico City, Mexico; (Supervisor: Dra. Mercedes Juan, Executive President)</p> <p>Harvard University, Cambridge, MA USA (Supervisors: Nobel Prize Laureate in Economics and Thomas W. Lamont University Professor of Economics and Philosophy Amartya Sen; Harvard University Provost Steven Hyman; Dr Paul Farmer, Presley Professor and Chair, Department of Global Health and Social Medicine, Harvard Medical School; Chief, Division of Global Health Equity, Brigham and Women's Hospital; United Nations Deputy Special Envoy to Haiti, Co-founder, Partners In Health.)</p> <p>Cáncer de Mama: Tómatelo a Pecho, Mexico City, Mexico (Knaul is the founder and directs the program which is in the process of being registered as an NGO with a board.)</p> <p>National Institute of Public Health of Mexico: Researcher; Center for Research on Health Systems (Supervisor: Dr. Miguel Angel Gonzalez Block)</p>		

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)
Grant Application

Principal Investigator(s):	Felicia Marie Knaul, PhD
Research Title:	Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Institution Address: (Postal Address)	Periférico Sur No. 4809, C.P. 14610, México, D. F. Col. El Arenal Tepepan, Deleg. Tlalpan Or Harvard Global Equity Initiative FXB Building, Room 632 651 Huntington Avenue Boston, MA 02115		
Research Location:	Mexico, City, Mexico		
Telephone(s)/Fax:	Office: 525 55 65559011 or 617 432 7938	Mobile: 521555 418 2217 or 617 999 9154	
	Residence: 978 261 5349 or 527773129527	Fax: 52555 6558211	
E-mail Address(es):	felicia_knaul@harvard.edu knaul@prodigy.net.mx Jennifer_goldsmith@dfci.harvard.edu harreola@funsalud.org.mx		
Degree(s)/Year(s)/Institution(s):	Harvard University (1989 to 1995) M.A. Economics. March, 1992. Ph.D. Economics. June, 1995 University of Toronto (1984-1988) BA, Economics and International Development		

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Experience in the Subject Area:

Dr. Knaul is an authority on health policy and the organization of health systems, as well women and health, with a focus on the LAC region. Since 1988, she has worked extensively in the LAC region, where she has been a resident since the early mid-1990s. She has served in high-level positions in the governments of Colombia and Mexico with a focus on health reform, education and health. She has worked in university settings, foundations, NGOs and as a consultant. Her affiliation with Funsalud dates to 1994.

She has published extensively on health reform and health finance, focusing on LAC. In 2006, she was awarded an international prize for her research on the Mexican health reform by the Global Development Network. She then served as coordinator of the Lancet series on the Mexican health reform published in a 7-part series between Sept and Nov of 2006 and editor of the re-print series in Spanish in a special edition of *Salud Pública de México* in 2007.

Since her diagnosis with breast cancer in November of 2007, Dr. Knaul has combined her personal experience and life with the disease with her expertise on health systems and quantitative analysis in health economics. This unusual combination of expertise and experience has led to the publication of numerous research papers and a special issue of the journal *Salud Pública de México*, as well as a personal narrative published in 2008 in *Reproductive Health Matters* and a book titled *Tómatelo a Pecho* published by Santillana, as well as ongoing public lectures.

In March of 2008, she founded the initiative *Cáncer de mama: tómatalo a pecho*, to build awareness, promote early detection and treatment and undertake and support on breast cancer in LAC. The initiative will become an independent NGO in Mexico in 2010.

She researches, publishes, speaks frequently, and serves on numerous advisory groups working on cancer prevention, care and control, with particular focus in the area of breast cancer diagnosis and delivery in less developed countries, and especially Mexico and Latin America.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Publications in the Subject Area:

Dr. Knaul is lead editor of the peer reviewed March 2009 special issue of *Salud Publica de Mexico*: Breast Cancer: Challenge for Societies and Health Systems. The publication reflects Dr. Knaul's successful integration of interdisciplinary scholars in developing powerful research to most effectively frame current issues in breast cancer. Reproductive Health Matters Nov 2008 special edition on women's cancers includes Dr. Knaul's (lead author) peer-reviewed article "Breast Cancer in Mexico: A pressing priority" as well as a personal account of her journey with breast cancer.

.....

Recent publications (since 2006):

1. Farmer P, Frenk J, Knaul FM, Shulman L, Alleyne G, Armstrong L, Atun R, Blayney D, Chen L, Feachem R, Gospodarowicz M, Gralow J, Gupta S, Lange A, Lob-Levyt J, Neal C, MBewu A, Mired D, Piot P, Reddy KS, Sachs JD, Sarhan M, Seffrin JR. Expanding Cancer Care and Control in Developing Countries: A Call-to-Action. Working Paper; 2010. Submitted and pending final acceptance by *Lancet*.
2. Shulman L, Sievers B, Willett H, Knaul F. Breast Cancer in Developing Countries: Opportunities for Improved Survival. Mimeo: Harvard University; 2010. Pending re-submission *Journal of Oncology*.
3. Knaul FM. *Tomatelo a Pecho*. (A personal account of my experience with breast cancer) Santillana. Mexico DF: Santillana, 2009.
4. Frenk J, Gómez-Dantés O, Knaul FM. "The democratization of health in Mexico: financial innovations for universal coverage." *Bulletin of the World Health Organization*, 2009; 87(7): 485-564.
5. Knaul FM, L Lopez, E Lazcano, H Gomez Dantes, I Romieu, G Torres. Guest Editors. "Cáncer de Mama: reto para la sociedad y para los sistemas de salud." Special Edition of *Salud Pública de México*. March 2009; Vol. 51(Suplemento 2):S131-S375.
6. Knaul FM, López Carrillo L, Lazcano Ponce E, Gómez Dantés H, Romieu I, Torres G. "Cáncer de mama: un reto para la sociedad y los sistemas de salud." *Salud Pública de México* 2009; Vol. 51s 2:S135-137.
7. Knaul FM, Nigenda G, Lozano R, Arreola-Ornelas H, Langer A, Frenk J. Cáncer de mama en México: una prioridad apremiante. *Salud Pública México* 2009; Vol. 51 suppl 2:S335-S344. (Spanish versión, original in English in *Repro Health Matters*)
8. Knaul FM, Arreola-Ornelas H, Velázquez E, Dorantes J, Méndez O, Ávila-Burgos L. El costo de la atención médica del cáncer mamario: el caso del Instituto Mexicano del Seguro Social. *Sal Pública de Méx.* 2009; V. 51 s 2:S286-S295.
9. Knaul F, Bustreo F, Ha E, Langer A. Breast cancer: Why link early detection to reproductive health interventions in developing countries? *Salud Pública de México* 2009; Vol. 51 suppl 2:S220-S227.
10. Knaul F. Testimony: "Una mujer ante el cáncer de mama en México". *Salud*

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)
Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Publications in the Subject Area:

10. Knaul F. Testimony: "Una mujer ante el cáncer de mama en México". *Salud Pública de México* 2009; Vol. 5, suppl 2:S364-S371.

11. Knaul FM, G Nigenda, R Lozano, H Arreola-Ornelas, A Langer and J Frenk. "Breast Cancer in Mexico: a pressing priority." *Reproductive Health Matters*. Vol. 16 (32), Nov 2008. 113-123.

12. Knaul FM. "I Am a Woman Who Lives with Breast Cancer". *Reproductive Health Matters*. Vol. 16 (32), Nov 2008. 133-138.

13. Knaul FM, Arreola H, Mendez O, Miranda M (2009). "Preventing impoverishment, promoting equity and protecting households from financial crisis: Universal Insurance through Institutional Reform in Mexico". Chapter 3 in "Addressing Challenges of Health Systems in the Developing World". Peter Smith and Diana Pinto, editors. Global Development Network and Edward Elgar.

14. Knaul FM, Arreola-Ornelas H, Méndez-Carniado O, Torres AC. (2007). "Impoverishing and catastrophic household health spending among families with older adults in Mexico: A health reform priority." Chapter 18. *The Health of Aging Hispanics: The Mexican-Origin Population*. Angel, JL, Whitfield KE. (Eds.). New York: Springer Publishing.

15. Knaul FM, Horton R (Eds.) Suplemento: La reforma del sistema de salud mexicano. Mexico, D.F.: Salud Pública México 2007, 49(suppl 1).

16. Knaul FM, Arreola-Ornelas H, Méndez-Carniado O, et al. (2006). "Evidence is good for your health system: policy reform to remedy catastrophic and impoverishing health spending in Mexico." *The Lancet* 2006; 368(9549): 1828-1841.

17. Frenk J, González-Pier E, Gómez-Dántes O, Lezana MA, Knaul FM. (2006) "Comprehensive reform to improve health system performance in Mexico." *The Lancet*; 368(9546):1524-1534.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

<i>Principal Investigator – Institution Contact Information</i>		
Signing Official - Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> Juan-Lopes Mercedes	
Title/Contact Info:	Title: Executive President	Phone: 52-55-56559011
Grants Official (if any) - Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> Valdes-Olmedo José Cuahtémoc	
Title/Contact Info:	Title: General Coordinator	Phone:
Technology Transfer/Business Development/Licensing Official (if any) - Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> n/a	
Title/Contact Info:		
Financial Official (if any) - Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> Morales Monsivais Juan Ramon	
Title/Contact Info:	Title: Public Accountant	Phone: 52-55-56559011
Media Contact (if any) - Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> Arreola Ornelas Héctor	
Title/Contact Info:	Title: Research Coordinator	Phone: 52-55-56559011
Quality Assurance, Accreditation, Compliance, Research Ethics – Name:	<div style="display: flex; justify-content: space-between;"> (Last) (First) (Middle) </div> Valdes-Olmedo José Cuahtémoc	
Title/Contact Info:	Title: General Coordinator	Phone: 52-55-56559011

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2nd Principal Investigator:			
	(Last)	(First)	(Middle)
Name	López-Carrillo Lizbeth		
Title(s) & Position(s):	Professor of Epidemiology/Senior Researcher, Center for Public Health Research, Mexico National Institute of Public Health and Professor of Epidemiological Methods, Center for Research and Advanced Studies, National Polytechnic Institute		
Institutions/Affiliations: (including Supervisor)	Mexico National Institute of Public Health		
Institution Address: (Postal Address)	Av. Universidad No. 655, Col. Santa Ma. Ahuacatitlán 62100 Cuernavaca, Morelos, MEXICO		
Research Location:	Cuernavaca, Morelos, MEXICO		
Telephone(s)/Fax:	Office: 52 (777) 329-3000 ext. 2501	Mobile:	
	Residence: 52 (777) 317-8334	Fax:	
E-mail Address(es):	lizbeth@insp.mx rcollado@insp.mx		
Degree(s)/Year(s)/Institution(s):	Universidad La Salle, Mexico City, Mexico B.Sc 1978-1982 Food Chemistry School of Public Health of Mexico M.P.H. 1985 Public Health School of Public Health of Mexico M. Sc.1987 Epidemiology Yale University, School of Medicine, U.S.A. Dr.P.H.1993 Epidemiology		
Experience in the Subject Area:	Dr. Lopez-Carrillo is a leading epidemiologist on breast cancer in the Latin American region. Over the past 17 years her research and publications have been essential to building an understanding of breast cancer burden in Latin America and the determinants of the disease especially behavioural aspects and nutritional factors. She holds the highest level of recognition from the National System of Researchers of Mexico (SNI) – Level 3.		

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Publications in the Subject Area:

1. **López Carrillo L**, Blair A, López Cervantes M, Cebrián M, Rueda C, Reyes R, Mohar A, Bravo J. DDT serum levels and breast cancer risk. A case control study from Mexico. *Cancer Research* 1997;57(17):3728-3732
2. **López Carrillo L**, Bravo, J, Poblano, O, Ortega D. Reproductive determinants of breast cancer in Mexican women. *Annals of New York Academy of Sciences*, 1997;837:537-550
3. **López Carrillo L**. ¿Es prevenible el cáncer? *Gaceta Médica de México* 1999;135(4):447-451
4. Jonine Bernstein, **Lizbeth López-Carrillo**. The epidemiology of HER-2/neu and p53 in breast cancer: a review of the literature. *Salud Pública de México*. 1999;41(Suppl. 2):S114-S123
5. Ortega Altamirano DV, **López Carrillo L**, López Cervantes M. Estrategias para la enseñanza del autoexamen del seno en mujeres en edad reproductiva. *Salud Pública de México* 2000;42(1):17-25.
6. Luisa Torres, **Lizbeth López Carrillo**, Malaquías López, Celina Rueda, Mary S. Wolff. Food sources of phytoestrogens and breast cancer risk in Mexican women. *Nutrition and Cancer* 2000;37(2):16-21.
7. Ofelia Poblano, **Lizbeth López Carrillo**, Jean René Clemenceau, Malaquías López. The reproducibility of breast cancer diagnosis through mammography: a pilot study in Mexico. *Woman and Cancer Journal*, Spirng, Vol. 2, Issue 1, 2000. Daylestown, PA, U.S.A. pp. 31-36
8. **Lizbeth López Carrillo**, Luisa Torres, Malaquías López, Celina Rueda. Identificación de lesiones mamarias malignas en México. *Salud Pública de México* 2001;43(3):199-202.
9. **Lizbeth López-Carrillo**, Malaquías López-Cervantes, Aaron Blair, Luisa Torres-Sánchez, Mariano Cebrián-García, Sandra García. Serum levels of beta-hexachlorocyclohexane, hexachlorobenzene and polychlorinated biphenyls and breast cancer risk in Mexican women. *European Journal of Cancer Prevention* 2002 Apr;11(2):129-135
10. Marcia Galván, **Lizbeth López Carrillo**, Luisa Torres. Dietary and reproductive factors associated with benign breast disease in Mexican women. *Nutrition and Cancer* 2002;43(2):133-140
11. Pastor Bonilla, Malaquías López, Luisa Torres, Guillermo Tortolero, **Lizbeth López Carrillo**. Nutritional factors and breast cancer in Mexico. *Nutrition and Cancer* 2003;45(2):148-155
12. López Cervantes M, Torres Sánchez L, Tobías A, **López Carrillo L**. DDT burden and breast cancer risk: a meta-analysis of the epidemiologic evidence. *Environmental Health Perspectives* 2004;112;207-214
13. Poblano O, Figueroa JG, **López-Carrillo L**. Condicionantes institucionales que influyen en la utilización del examen clínico de mama. *Salud Pública de México* 2004;46(4):294-305
14. Gerson A. Soto-Peña, Ana L. Luna, Leonor Acosta-Saavedra, Patricia Conde-Moo, **Lizbeth López-Carrillo**, Mariano E. Cebrián, Mariana Bastida, Emma S. Calderón-Aranda, Libia Vega. Assessment of lymphocyte subpopulations and cytokine secretion in children exposed to arsenic. *The FASEB Journal* 2006;20(6):779-781.
15. Marcia V. Galván-Portillo, Angélica Flores, Luisa Torres-Sánchez, Raúl Ulises Hernández, **Lizbeth López-Carrillo**. Consumo de micronutrientos y mortalidad por cáncer mamario en mujeres premenopáusicas mexicanas. *Cancerología* 2007;345-350
16. Marc-André Verner, Michel Chabonneau, **Lizbeth López-Carrillo**, Sami Haddad. Physiologically-Based Pharmacokinetic Modeling of Persistent Organic Pollutants for Lifetime Exposure Assessment: A New Tool in Breast Cancer Epidemiology Studies. *Environmental Health Perspectives*.2008 (JUL);116(7):886-892.
17. Rubén Ruiz Ramos, **Lizbeth López-Carrillo**, Alfonso D. Rios-Pérez, Andrea De Vizcaya-Ruiz, Mariano Cebrián-García. Sodium arsenite induces ROS generation, DNA oxidative damage, HO-1 and c-Myc proteins, NF-kappaB activation and cell proliferation in human breast cancer MCF-7 cells. *Mutation Research* 2009(Mar 31);674:109-115.
18. Francisco Franco-Marina, Eduardo Lazcano-Ponce, **Lizbeth López-Carrillo**. Breast cancer mortality in Mexico. An age-period-cohort analysis. *Salud Pública de México* 2009 (vol. 51, suplemento 2):S157-S164

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Publications in the Subject Area:

18. Francisco Franco-Marina, Eduardo Lazcano-Ponce, **Lizbeth López-Carrillo**. Breast cancer mortality in Mexico. An age-period-cohort analysis. *Salud Pública de México* 2009 (vol. 51, suplemento 2):S157-S164.
19. **Lizbeth López Carrillo**, Leticia Suárez López, Luisa Torres Sánchez. Detección del cáncer de mama en México. Síntesis de los resultados de la Encuesta Nacional de Salud Reproductiva. *Salud Pública de México* 2009 (vol. 51, suplemento 2): S345-S349.
20. Luisa Torres Sánchez, Marcia Galván Portillo, Sara Lewis, Héctor Gómez Dantés, **Lizbeth López Carrillo**. Dieta y cáncer de mama en Latinoamérica. *Salud Pública de México* 2009 (vol. 51, suplemento 2): S181-S190.
21. Rafael Lozano Ascencio, Héctor Gómez Dantés, Sara Lewis, Luisa Torres Sánchez, **Lizbeth López Carrillo**. Tendencias de cáncer de mama en América latina y El Caribe. *Salud Pública de México* 2009 (vol. 51, suplemento 2): S147-S156.
22. Luisa Torres-Sánchez, Marcia Galván-Portillo, Mary S. Wolff, **Lizbeth López-Carrillo**. Dieta Consumption of phytochemicals and breast cancer risk in Mexican women. *Public Health Nutrition* 2009;12 (6):825-831.
23. Rubén Ruiz Ramos, **Lizbeth López Carrillo**, Arnulfo Albores, Raúl U. Hernández Ramírez, Mariano Cebrián. Sodium arsenite alters cell cycle and MTHFR, MT1/2, and c-Myc protein levels in MCF-7 cell. *Toxicology and Applied Pharmacology* 2009;241:269-274.
24. **Lizbeth López-Carrillo**, Raúl U. Hernández-Ramírez, Antonia M. Calafat, Luisa Torres-Sánchez, Marcia Galván-Portillo, Larry L. Needham, Rubén Ruiz-Ramos, Mariano E. Cebrián. Exposure to phthalates and breast cancer risk in Northern Mexico. *Environmental Health Perspectives* 2010;118(4):539-544
25. Knaul FM, **López-Carrillo L**, et al., México Reporte Rosa 2009-2010: Cáncer de mama a conciencia Informe final. México, D.F.: Fundación Mexicana para la Salud, 2009 (Primera Edición). ISBN 978-607-7897-00-2.

Chapters in Books

- López Carrillo L.**, Vandale, S., Alonso de Ruiz, P, Fernández Ortega, C, Parra Cabrera, S. Cáncer cervicouterino y mamario en la mujer mexicana. En: *Mujer: Sexualidad y salud reproductiva en México*. The Population Council, México, 1996 pag.317-341. ISBN 968 409 877 4
- Lizbeth López-Carrillo**. Human Health. Cancer. En: *Global assessment on the State-of-the-Science of Endocrine Disruptors*. UNEP/ILO/WHO. 2002.
- Lizbeth López Carrillo**. El cancer mamario. Epidemiología y Prevención. El Colegio Nacional. Primera Edición: 2003.
- Lizbeth López Carrillo**, Leticia Suárez López. Cáncer de Mama. En: *La Salud Reproductiva en México Análisis de la Encuesta Nacional de Salud Reproductiva 2003*. Secretaría de Salud/Universidad Nacional Autónoma de México. Primera Edición 2007. pp. 236-252. ISBN 970-32-3952-2

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2nd Principal Investigator – Institution Contact Information (if different from PI)			
Signing Official - Name:	(Last)	(First)	(Middle)
	Rodriguez, Mario Henry		
Title/Contact Info:	Title: Director, National Institute of Public Health, Mexico	Phone: 52 (777) 1012928 mhenry@insp.mx	
Grants Official (if any) - Name:	(Last)	(First)	(Middle)
	n/a		
Title/Contact Info:	Title:	Phone:	
Technology Transfer/Business Development/Licensing Official (if any) - Name:	(Last)	(First)	(Middle)
	n/a		
Title/Contact Info:	Title:	Phone:	
Financial Official (if any) - Name:	(Last)	(First)	(Middle)
	Dominguez Castillo, Ignacio Jose		
Title/Contact Info:	Title: Director of Administration and Finances	Phone: 52 (777) 1012924 ignacio.dominguez@insp.mx	
Media Contact (if any) - Name:	(Last)	(First)	(Middle)
	n/a		
Title/Contact Info:	Title:	Phone:	
Quality Assurance, Accreditation, Compliance, Research Ethics – Name:	(Last)	(First)	(Middle)
	Castro Romero, Julieta Ivonne, President of the Ethics Committee, 52 (777) 3293000 ext. 7424		

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2. ELIGIBILITY CRITERIA – PRINCIPAL INVESTIGATOR(S) AND INSTITUTION(S) ¹ (Please check (✓) all that apply)	
INVESTIGATOR: Felicia Marie Knaul	
“I attest that I ...”	
X	Have at least one doctoral degree, such as MD, PhD, or the equivalent.
X	Have the support of the institution where the research will be conducted (if applicable).
X	Have a working knowledge of written and spoken English.
X	Am a citizen of one’s home country in good standing.
X	Adhere to Good Laboratory and Research Practices and/or other application research practice standards in accordance with all regulatory, ethics and related local and international standards of conduct.
X	Will adhere to quarterly or other GSK ERI research project progress reporting requirements.
X	Am applying for funding for a research project not already being funded by another program or foundation or otherwise owned or controlled by another party or institution.
Comments:	

INSTITUTION OF PRINCIPAL INVESTIGATOR: (If applicable)	
“I attest that my institution Funsalud”	
X	Will allow me (us) as Investigator(s) to utilize the institution’s facilities.
X	Will not charge more than 20% of the total grant award funds for institutional charges/allocations or other indirect costs (i.e. indirect costs may not exceed 25% of direct costs of the project.)
X	Complies with Good Laboratory and Research Practices and/or other applicable research practice standards, as well as is in compliance with all regulatory, ethics, and related local and international standards of conduct.
Comments:	

¹ Copy and Repeat for a 2nd Principal Investigator

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2. ELIGIBILITY CRITERIA – PRINCIPAL INVESTIGATOR(S) AND INSTITUTION(S) ² (Please check (✓) all that apply)	
INVESTIGATOR: Lizbeth Lopez-Carrillo	
“I attest that I ...”	
X	Have at least one doctoral degree, such as MD, PhD, or the equivalent.
X	Have the support of the institution where the research will be conducted (if applicable).
X	Have a working knowledge of written and spoken English.
X	Am a citizen of one’s home country in good standing.
X	Adhere to Good Laboratory and Research Practices and/or other application research practice standards in accordance with all regulatory, ethics and related local and international standards of conduct.
X	Will adhere to quarterly or other GSK ERI research project progress reporting requirements.
X	Am applying for funding for a research project not already being funded by another program or foundation or otherwise owned or controlled by another party or institution.
Comments:	

INSTITUTION OF PRINCIPAL INVESTIGATOR: (If applicable)	
“I attest that my institution Funsalud”	
X	Will allow me (us) as Investigator(s) to utilize the institution’s facilities.
X	Will not charge more than 20% of the total grant award funds for institutional charges/allocations or other indirect costs (i.e. indirect costs may not exceed 25% of direct costs of the project.)
X	Complies with Good Laboratory and Research Practices and/or other applicable research practice standards, as well as is in compliance with all regulatory, ethics, and related local and international standards of conduct.
Comments:	

² Copy and Repeat for a 2nd Principal Investigator

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3. RESEARCH PROPOSAL

**The Application Form will be sent to the ESC Reviewers for the selection.
Please be clear, specific, accurate and sufficiently detailed.**

3.1: SPECIFIC AIMS
State the broad, long-term objectives and specific aims of the project.

Specific research aims

1. Identify the age-specific distribution of diagnosis and death, comparing LAC to other regions of the developed and developing world.
2. Determine the degree to which these age distributions can be explained by patterns and trends in demographic transition, family formation, reproductive health, nutrition, labor force participation and education, among others.
3. Project, under different scenarios of trends in demographics, family formation, reproductive health patterns, nutrition, labor force participation and education, holding constant health system inputs for diagnosis and treatment the number and age distribution of breast cancer cases and deaths focusing on the LAC region. Then project possible changes in and impact of health system inputs for early diagnosis and treatment.
4. Analyze in greater detail specific aspects of the global and regional results, through in-depth analysis of existing country-specific quantitative data for Mexico, Costa Rica, Dominican Republic and Colombia on the age-distributions and determinants.
5. Analyze in greater detail specific aspects of the global and regional results, through qualitative research to identify barriers to reporting the disease on both the supply (health system) and demand (patients and families) side.
6. Strengthen the understanding of health system determinants and the policy recommendations derived from the quantitative and qualitative research through the analysis of the organization of health systems, health financing and health care inputs in LAC and specifically in Colombia, Mexico, Costa Rica and the Dominican Republic – all countries that have been expanding through health system innovations, publicly financed options for covering breast cancer diagnosis and treatment.

Goals in terms of specific output and products:

1. Produce at least 4 papers with a regional and global perspective including: i) a descriptive analysis of the age distribution of diagnosis and death; ii) the age-cohort-period analysis focusing on developing countries and particularly on differences within LAC; iii) the associations between determinants and socio-demographic factors and the distribution by age of diagnosis and death; 4) age-specific projections of incidence and mortality under varying scenarios for socio-demographic and population-based risk factors such as trends in nutrition. All papers will focus on developing countries and particularly on differences within LAC and guided by the in-depth knowledge of health and health system determinants in specific LAC countries.
2. Produce at least 4 country-specific papers on each of Mexico (focusing on utilization of health services for early detection), Colombia (focusing on the Cali registry), Costa Rica (focusing on the national registry and ethnic differences) and the Dominican Republic (legal versus effective coverage) combining qualitative and quantitative data and deriving policy conclusions. Produce one comparative paper focusing on the design of health reform and health financing to include breast cancer in the package of covered services for the poor, and another on the results of the focus groups on barriers to access to early detection and treatment.
3. Participate in and undertake local dissemination in these 4 countries to improve update of results for policy

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

formulation.

4. Participate in international academic and policy forum to share the results of the research.
5. Translate results into policy briefs with a focus on evidence-for-decision-making that can be useful to national and sub-national policy makers, global and regional institutions, and global and local advocacy groups.
6. Produce and make available data sets at the global, regional and national levels with a particular focus on the LAC region.

Broad, long-term objectives

The following objectives include desired, longer-term outcomes of the specific research and activities proposed in the grant. The 'aims' listed below correspond to the specific objectives of the proposed research work.

1. Improve the outcomes of women with breast cancer in the LAC region through earlier detection of invasive disease (downstaging) and reducing barriers on the demand and supply sides to accessing treatment.
2. Increase the ability of health systems to target and allocate scarce resources for early detection and diagnosis especially among disadvantaged groups (in terms of poverty and health system access) in both the long and short run by understanding the age distribution of diagnosis and death.
3. Contribute to the understanding of the complex relationship between age at onset, age at diagnosis and age at death, as well as and to the extent possible with available data, incidence, prevalence and mortality in specific populations with age-cohort analysis and descriptive analysis. Analyze the implications of how late detection and hence lower probability and length of survival is concentrated in certain population groups particularly those who experience greater barriers to health systems utilization (the poor, specific ethnic groups) within and between countries.
4. Better understand the relationship between poverty (often associated with ethnicity) in LAC and breast cancer diagnosis and mortality in order to guide policy.
5. Better understand the determinants of age of onset, age at diagnosis and mortality between countries, by studying how risk factors are associated with differences in socio-demographic conditions of populations including poverty and ethnicity.
6. Determine the extent to which the younger age at diagnosis of breast cancer in LIMCs, and especially LAC, is determined by demographics (population aging) and how this will change over time as a population ages and risk factors for breast cancer become more prevalent in poorer populations.
7. Project, the pattern and distribution of breast cancer by age group, socio-economic level and ethnicity in the LAC region under different scenarios of female labour force participation, education, childbearing, breastfeeding, menarche and menopause, weight gain and obesity. Relate the projections to options for influencing behavior including education and awareness building around early detection.
8. Identify the different barriers to access to early detection of breast cancer in LAC and possible options for their reduction.
9. Improve the quality and utilization of existing data by studying and making recommendations regarding existing cancer registries (Cali, Colombia; Costa Rica; Jalisco, Mexico); encouraging the implementation of additional registries in other countries in LAC and states and regions of Colombia and Mexico; and, sharing the national, regional and global data bases that will be constructed through this project.
10. Identify strategies for future research for LAC and other developing regions that would be guided and motivated by the hypotheses and results of the quantitative, qualitative, ecological and health systems research proposed here,

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

and would include field-based studies to gather data on the interactions between determinants such as environment and nutrition on age at diagnosis of breast cancer.

11. Contribute to increased awareness of the need for breast cancer diagnosis and treatment among LAC women of all age groups, levels of income and ethnic backgrounds.
12. Generate and establish a multi-disciplinary (demography, epidemiology, economics, gender studies, health systems research, development studies, reproductive and women’s health and breast oncology) research group dedicated to study and promote better understanding of the challenge of breast cancer among women in developing countries.

3.2: RESEARCH IMPACT

Explain how this research will increase the fundamental knowledge and improve understanding of ethnic factors in breast cancer research and management.

****taken from LOI as per instructions Guidelines and italics in title. With minimal updating to delineate ethnic and poverty-related research impact and ideas developed since submission of LOI****

This research will provide important insight into the patterns of breast cancer incidence and mortality among underserved populations and across different ethnic groups. The in-depth and cross-country research will delve into the strong association between poverty and ethnicity in LAC (as well as other countries including the US), and certain risk factors are associated with level of income, place of residence and ethnicity. Further, the research will consider trends and behavioral changes in low-income populations that are associated with economic development such as urbanization, reduced family size, weight gain and increased labor force participation of women.

It is particularly important to highlight the policy implications of the research for the health systems dedicated to serving low-income populations. The results will help to target interventions to populations and also provide input into medium-term planning for detection, diagnosis and treatment.

As described in the LOI, the research will contribute in each of the areas listed below.

- 1) Develop and disseminate information on the distribution and number of women and families affected by breast cancer in the developing world, and particularly in LAC.
- 2) Develop a multi-disciplinary approach and understanding that can be applied in other settings and a research group that can work together on future projects in the realm of cancer and women and health
- 3) Identify and analyze multiple risk factors with a focus on behavioral aspects and how these are associated with onset of disease and age of diagnosis which provides input into:

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

- a. policy making and targeting of scarce health system resources; and,
- b. future research:
 - i. on other developing and transition regions (Asia, MENA, Afro, CEE)
 - ii. in-depth clinical and epidemiological studies of specific determinants and risk factors.
- 4) Provide specific recommendations for: health promotion and prevention through public health interventions (based on reducing risk factors); early detection including age for screening and target populations for breast clinical examination and awareness building; barriers to screening and awareness building; insurance coverage and organization of packages of covered health services
- 5) Provide insight and recommendations for improving global and national data registries and surveys on cancer, especially of women.

3.3: BACKGROUND & RESEARCH SIGNIFICANCE

Previous research done by the PI(s) and others in the area to be investigated; ideas and foundations upon which this project will be based and how this project will progress or advance understanding and outcomes in this area; restates the main hypothesis (es) and/or objectives of the Research Project and supporting rationale.

Based on LOI as per instructions.

Though typically and incorrectly thought to be a disease of developed countries and wealthy populations, breast cancer today is a disease increasingly concentrated in the low and middle-income countries (LIMCs) of the developing world (Porter, 2008). The most recent data from Globocan from 2008 (<http://globocan.iarc.fr/>), show that almost one-third of deaths and half of all cases are from developing countries and that these figures are expected to continue to increase over the coming decades. Breast cancer is now a leading cause of death among women in many developing countries, and has surpassed cervical cancer in all but the poorest developing regions.

An important set of questions exist around the burden of breast cancer in low and middle-income countries and regions. One of the most pressing areas for research given the current trends, concerns the impact of the disease on women from low-socioeconomic settings and particularly disadvantaged groups that are typically more marginalized from access to health systems. Differentials in survival, approximated by the ratio of incidence to mortality in a given year, show large gaps between developed and developing countries and hence between rich and poor.³ The Globocan 2008 data figures are: .48 in high-income countries, .4 in upper middle-income, .38 in lower middle-income and only .24 in low-income countries (calculations by Knaul, Arreola and Méndez based on Globocan 2008).

³ Cancer Control Opportunities in Low- and Middle-Income Countries. Washington, DC: Institute of Medicine of the National Academies, National Academies Press; 2007. Beaulieu N, Bloom D, Bloom R, Stein R. Breakaway: The global burden of cancer - challenges and opportunities. The Economist Intelligence Unit. 2009.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Researchers and clinicians have documented and presented their concern about the observed lower age of reported incidence and death of women who are diagnosed with breast cancer in developing countries.⁴ Breast cancer presents a high burden of morbidity and mortality for premenopausal women whose disease may be particularly difficult to treat even if detected early. The research proposed here seeks to contribute to a better understanding of the early peak in breast cancer age at diagnosis, and the relationship between determinants associated with changing lifestyles and economic, social and demographic change and the increasing incidence rates among younger women in developing countries – an issue that has been brought forward in the recent literature.⁵ The research is particularly focussed on understanding differences and lessons for low-income and marginalized populations.

One of the most striking observations is that in LIMCs, 63% of women diagnosed with breast cancer are below age 54 compared with 36% in high-income countries. Further, these figures are likely to understate real differences in age at onset given late diagnoses in developing countries.⁶ The figures for age at death are even more disturbing - 50% versus 22% - and are likely to reflect late detection and lack of access to treatment, but perhaps also the age distribution of onset of the disease and the high proportion of cases in young women. (Calculations by Knaul, Arreola and Méndez, based on Globocan 2002.).

Though the data to demonstrate this is lacking, these differences between rich and poor are also likely to exist within countries and across particular population groups. In Mexico, for example, breast cancer is the second cause of death in women aged 30-54 as of 2006. Access and utilization of services for early detection is also much more limited among women of poorer women. Only 16% of women aged 40-69 from the poorest 20% of the population report having had a mammogram or breast clinical exam compared to 28% (also very low) in the highest income group.⁷ Qualitative research also demonstrates the barriers to access for the poor.⁸

While the differences in age at onset (proxied by age at detection or diagnosis) may be entirely attributable to differences in the age distributions of populations across and within countries, there may be other factors and determinants. In the case of age at death, it is clear that there is a complex interaction between socio-demographic, behavioural and health system determinants. Further, population aging and changes in behaviour of women around risk factors for breast cancer associated with economic and social development will be important determinants of future incidence and life with the disease.

⁴ Knaul FM, L López, E Lazcano, H Gomez Dantés, I Romieu, G Torres. Guest Editors. "Cáncer de Mάma: reto para la sociedad y para los sistemas de salud." Special Edition of *Salud Pύblica de Mόxico*. Vol 51, S2, March 2009. Knaul FM, G Nigenda, R Lozano, H Arreola-Ornelas, A Langer and J Frenk. "Breast Cancer in Mexico: a pressing priority." *Reproductive Health Matters*. Vol. 16 (32), Nov 2008; International Symposium: Breast Cancer in the Developing World: Meeting the Unforeseen Challenge to Women, Health and Equity. <http://isites.harvard.edu/icb/icb.do?keyword=k62597&tabgroupid=icb.tabgroup96975>. Breast Cancer in Developing Countries: Opportunities for Improved Survival. Mimeo. LN Shulman, A Sievers, W Willett and FM Knaul. 2010.

⁵ Porter, P. Global Trends in Breast Cancer Incidence and Mortality. Special Edition of *Salud Pύblica de Mόxico*. Cáncer de mama: un reto para la socienda y los sistemas de salud. Vol 51, S 2, March 2009.

⁶ Knaul FM, Arreola-Ornelas H, Velázquez E, Dorantes J, Méndez O, Ávila-Burgos L. El costo de la atención médica del cáncer mamario: el caso del Instituto Mexicano del Seguro Social. Special Edition of *Salud Pύblica de Mόxico*. Cáncer de mama: un reto para la socienda y los sistemas de salud. Vol 51, S 2, March 2009; Shulman L, Sievers B, Willett H, Knaul F. Breast Cancer in Developing Countries: Opportunities for Improved Survival. Mimeo: Harvard University; 2010.

⁷ Knaul FM, L López, E Lazcano, H Gomez Dantés, I Romieu, G Torres. Guest Editors. "Cáncer de Mάma: reto para la sociedad y para los sistemas de salud." Special Edition of *Salud Pύblica de Mόxico*. Vol 51, S 2, March 2009. Knaul FM, G Nigenda, R Lozano, H Arreola-Ornelas, A Langer and J Frenk. "Breast Cancer in Mexico: a pressing priority." *Reproductive Health Matters*. Vol. 16 (32), Nov 2008; International Symposium: Breast Cancer in the Developing World: Meeting the Unforeseen Challenge to Women, Health and Equity. <http://isites.harvard.edu/icb/icb.do?keyword=k62597&tabgroupid=icb.tabgroup96975>. Breast Cancer in Developing Countries: Opportunities for Improved Survival. Mimeo. LN Shulman, A Sievers, W Willett and FM Knaul. 2010.

⁸ Nigenda, G; Caballero, M, Gonzalez LM. Barreras del acceso al diagnóstico temprano del cáncer de mama en el Distrito Federal y Oaxaca. Special Edition of *Salud Pύblica de Mόxico*. Cáncer de mama: un reto para la socienda y los sistemas de salud. Vol 51, S 2, March 2009.

⁹ Lozano, R, Gomez H, Lewis S, Torres L, Lopez L. Tendencias del cáncer de mama en América Latina y el Caribe. Special Edition of *Salud Pύblica de Mόxico*. Cáncer de mama: un reto para la socienda y los sistemas de salud. Vol 51, S 2, March 2009.

¹⁰ Revista America Economía

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

A better understanding of the nature and determinants of the age distribution of the disease, and the projections of how the diseases will affect women and particularly low-income women, in the developing world can provide key elements to improve the design and implementation of breast cancer treatment and early detection initiatives. The degree to which these differences can be explained by the age distribution of populations (developing countries are at earlier stages of the demographic transition and hence younger; low-income populations also tend to be at early stages of the transition and younger) is a research question that requires multidisciplinary analysis. There are many determinants that interact with population aging and these include: rates and trends in nutrition, obesity, reproductive patterns and lifestyle; the rapid increase in the education of women and female labor force participation; and, under and misreporting of deaths (both by the health system and patients due for example to stigma and cultural and gender barriers), among others. Further, many of these determinants are associated with behaviors that are rapidly changing among low-income populations as part of the process of economic and social development, including changes in the participation of women in society and labor markets, and eating patterns.

Perhaps the most difficult to answer due to limited data, is the difference in the disease profile of breast cancer across heterogeneous groups and how this may interact with other disease patterns. To the extent that the effect of demographics and changing behavioral patterns can be 'factored or projected out' by modeling the evolution of the disease, differences across countries and specific population groups may then be attributed to genetic, environmental or other health factors intrinsic to populations. While this is a question that is beyond the scope of the proposed research, the study will shed light on the amount of unexplained heterogeneity that remains after these other factors are account for and analyzed.

The answer to questions about the age distribution of the diagnosis of disease will provide important results for the formulation of policy around issues such as the appropriate age to introduce screening mammography and options for targeting awareness and education in low-income groups where screening mammography may not be universally or easily available. Specifically, by providing information on the number of women and young women, and among which specific population groups, who are likely to be diagnosed – based on recent trends, differences across countries and associations with changes in risk factors and demographics - over the coming decades, policy makers can more appropriately design and target early detection interventions.

The proposed research will focus on developing an inter-disciplinary approach to measuring and analyzing the multiple determinants of the age distribution (onset, life with disease and mortality) of breast cancer in the developing world (versus developed countries) focusing on Latin America and Caribbean (LAC). This developing region provides a particularly appropriate focus for this research because of the varied socio-demographic conditions within and between countries. While the region includes several middle-income countries (such as Mexico and Colombia) it also includes much poorer countries (such as the Dominican Republic and Haiti). In addition, the distribution of income within the region tends to be highly unequal, reflecting the existence of high levels of poverty among particular groups and sub-regions. Further, the region includes varied ethnic, racial and cultural groups and these differences are often associated with the concentration of poverty within countries. (PAHO, 2001; Hall & Patrinos, 2005) Further, breast cancer is now one of the leading causes of death among women, and particularly young women, and incidence has been increasing over the past 2-3 decades in most countries for which data are available.⁹

In this proposed research project, the first hypothesis to be tested is that differences in the age distribution of onset, proxied by age at diagnosis, are entirely explained by demographic differences and 'disappear' if the data are appropriately analyzed by age group (age specific rates). The results of this analysis will help to determine the rest of the analysis which will then consider: 1) how will the patterns in onset of disease, age at detection and mortality change as populations age, and 2) how are increasing risk factors among different

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

population groups – and particularly the poor as compared to other groups - likely to affect the number and distribution of women with breast cancer. Both cross-country and within country differences will be analyzed (based on registry data from Colombia and Costa Rica). The rest of the analysis will be devoted to understanding the determinants of age at detection of breast cancer in low-income populations using qualitative and quantitative research techniques, focusing on 4 countries (Colombia, Mexico, Costa Rica and the Dominican Republic), to identify the impact of demand side factors (gender discrimination, lack of knowledge etc) and supply side factors (lack of access to infrastructure for detection and low quality health services).

A group of collaborators (listed in part 3.7 of this proposal) has been identified that include health system researchers, epidemiologists, demographers, economists, a breast oncologist and experts in the detection, determinants and disease history of breast cancer, as well as social scientists with expertise in issues such as education, female labor force participation and gender and development. This group combines researchers based in and with knowledge of LAC, with expertise in use of global data to undertake region-specific, comparative analysis, and in qualitative methods. In developing this proposal, we have also identified and reached out to collaborators working at IARC/Globocan; with the cancer registries of Cali, Jalisco and Costa Rica; and with expert statisticians/epidemiologists at Harvard University (Donna Spiegelman, Professor of Epidemiologic Methods, Department of Epidemiology and Department of Biostatistics, Harvard School of Public Health) and the University of Washington (Dr. Rafael Lozano, Professor of Global Health, Institute for Health Metrics and Evaluation) who have offered to provide data, professional guidance and advice on the use of data and input into statistical methods.

Our proposed research and methodology (elaborated below) is divided into:

- 1) Identify the age specific distribution of diagnosis and death, comparing LAC to other regions of the developed and developing world.
- 2) Determine the degree to which these can be explained by patterns and trends in demographic transition, family formation, reproductive health, nutrition, labor force participation and education, among others.
- 3) Project, under different scenarios of trends in demographics, family formation, reproductive health patterns, nutrition, labor force participation and education, holding constant health system inputs for diagnosis and treatment the number and age distribution of breast cancer cases and deaths focusing on the LAC region. Then project, possible changes in and impact of health system inputs for early diagnosis and treatment.
- 4) In-depth analysis of country-specific quantitative data for Mexico, Costa Rica, Dominican Republic and Colombia on age-distribution and determinants.
- 5) Qualitative research to identify barriers to reporting and detecting the disease on both the supply (health system) and demand (patients and families) side.
- 6) Linking results and recommendations to analysis of the organization of health systems and health care inputs.

INSTITUTIONAL AND RESEARCH COLLABORATION AND EXPERIENCE:

The lead institution for this project is the Mexican Health Foundation (Funsalud) a research and policy-oriented think tank with more than 25 years of work in the LAC region. Within Funsalud, the work will be situated in the program Cáncer de mama: Tómatelo a pecho (TAP), a project begun in 2008 to promote early detection and better treatment of breast cancer, initiated by Felicia Knaul as a health systems researcher and person living with breast cancer. TAP and Funsalud have led several research projects on breast cancer in Mexico and in the region over the past 2 years including an ongoing project with CONACyT (the National Science and Technology Council of Mexico). The work produced a paper in a special edition of *Reproductive Health Matters* in Nov of 2008 co-authored by Knaul with several of the researchers who are proposed as collaborators on this project. Further, Funsalud organized an international seminar held in Mexico City in late 2008 and then produced a 25-paper special issue of the journal *Salud Pública de México* (of the National

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Institute of Public Health (INSP) on breast cancer in Mexico and the LAC region.

The National Institute of Public Health is an institution affiliated to the Ministry of Health of Mexico and thus the Government of Mexico and holds official standing as a public institution of higher education and research. It is legally constituted to grant graduate-level degrees and undertake scientific research and includes a full range of academic and scientific services including IRB. The INSP is also directly responsible for much of the data collection and survey and evaluation design for the Mexican health sector and is the repository for much of these data including the National Health Surveys. The Mexico National Institute of Public Health (INSP in spanish) is committed to research, teaching and service for the development of equitable health in Mexico and throughout the world. Breast cancer research is one of the fifteen current research lines in the INSP.

INSP researchers have contributed with scientific knowledge about epidemiology, risk factors and health services research in the most prestigious international journals. Also, students at master and doctoral levels from Mexico and Latin American countries, are trained every year in cancer biology, epidemiology and policy with the aim to integrate molecular, individual, population and policy research. Permanent support by INSP cancer experts, is provided to national health authorities such was the case of the recent revision of the guidelines for the prevention and control of breast cancer.

Fundación Mexicana para la Salud and INSP have collaborated extensively since their respective inceptions and have developed several joint efforts, including breast cancer research. Specifically, Dr. Felicia Knaul and Dr. López-Carrillo designed and coordinated a special issue in Salud Publica de México, in March of 2009 that included comprehensive information about the situation of Breast Cancer in Latin American countries and promoted breast cancer research in Mexico and other countries of the Region. Dr. Felicia Knaul also coordinated a special issue in Salud Publica de Mexico in 2007 on Health System Reform in Mexico. Knaul is an associate researcher at the Research Centre of the INSP and periodically participates in conferences and courses. She also supervises Masters and PhD level students from the INSP. Currently, the Funsalud and INSP, working with Cancer de mama: Tomatelo a Pecho are collaborating in the evaluation of a program on early detection of breast cancer in Jalisco, Morelos, and Nuevo Leon.

The research teams from the 4 LAC countries have undertaken extensive prior work on breast cancer, as well as on the organization of health systems. Further, Funsalud and TAP have worked closely with the majority of the researchers and research institutions proposed for this research over the past years. Many participated in the international seminars on breast cancer in Mexico in 2008 and in Boston in 2009. Others have collaborated with Funsalud and INSP on studies of health systems and reform (Carmen Eliza Flores and Ramiro Guerrero). Further, TAP and Funsalud have also funded, co-coordinated and participated in: a national, qualitative research study on barriers to early detection and treatment under the leadership of Dr. Gustavo Nigenda at the INSP; a study of needs and policy issues in Costa Rica with Dr. Rocio Saenz; and a similar study on the DR with Mtra. Magdalena Rathe and Fundación Plenitud.

Ramiro Guerrero, as of August 2010, will be directing a new research center in Cali, Colombia- the Center for Health Economics (CHE), affiliated with Fundación Valle del Lili (FVL) and Universidad ICESI. FVL (www.valledellili.org) is a non-for-profit research hospital, the largest in its region and a recognized national leader in several clinical fields and ranked among the 20 best hospitals in Latin America¹⁰. More than 150 specialists work full time at FVL. It has successful international collaborations with Pittsburgh Medical Center, Stanford University and is linked to the Boston Children's Hospital as a sister renal center. FVL was among the first Colombian hospitals to receive, in 2007, the high quality national accreditation awarded by the national government. Universidad ICESI (www.icesi.edu.co) is a leading private university based in Cali. It has successful international collaborations with Tulane University and Texas A&M University. CHE is a spinoff of the FVL Institute for Clinical Research, the School of Medicine at ICESI (of which FVL is the teaching hospital) and the School of Economics and Business at ICESI. The research agenda of CHE includes economic evaluations of health programs and technologies, health systems financing and health metrics for

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

performance evaluation. CHE will also serve as hub for coordinating in Colombia the activities of the Latin American Health Observatory.

Access to networks: Funsalud will work in close relationship with the Harvard Global Equity Initiative, as well as with the Harvard School of Public Health, the Harvard Medical School through the Global Task Force on Expanded Access to Cancer Care and Control in Developing Countries. This will enrich the base of research collaborators and the projection and translation of country- and region-specific recommendations into global, regional and national policy spheres. This is an on-going collaboration and research exchange that began with the International Seminar, 'Breast Cancer in Developing Countries: meeting the unforeseen challenge to women, health and equity' held at Harvard University in November of 2009. It was at this conference that many of the ideas for the work proposed for this project for first discussed.

The research proposed is an input into the work of the Global Task Force for Expanded Cancer Care and Control in Developing Countries. The mandate of the GTF.CCC is to design, implement, study and evaluate opportunities for expanding access to cancer prevention, detection and care in the developing world. The initiative will focus on the implementation of innovative service delivery models that are adapted to local contexts, and the creation of global facilities and strategies for the financing, procurement and delivery of affordable, essential cancer drugs. HGEI, with Dr. Knaul as director, is Secretariat to the GTF.CCC which is co-chaired by Doctors Julio Frenk, Dean of the Harvard School of Public Health and Lawrence Shulman, Chief Medical Officer and Senior Vice-President for Medical Affairs at the Dana Farber Cancer Institute. HRH Princess Dina Mired of Jordan and Lance Armstrong are the honorary co-presidents of the Task Force. The 20+ person Task Force includes global leaders in cancer, women and health, global health and AIDS. Interaction with this initiative will allow for substantial dissemination of results and project of local and regional findings into the global arena.

Through Funsalud, this project will also be able to work with the LAC Health Observatory – an initiative based at Funsalud – and work with groups of researchers dedicated to the analysis of burden of disease, effective coverage of health interventions, health spending and comparative risk analysis. The LAC Health Observatory is a network that includes 247 researchers from 18 LAC countries.

3.4: RESEARCH DESIGN & METHODS

Details of the study design, methods and analysis (including sample size, controls, statistical analysis). If new methods are to be used, describe in sufficient detail. If human or animal or samples require acquisition, describe how this will be accomplished.

Part 1: Identify the age specific distribution of diagnosis and death, comparing LAC to other regions of the developed and developing world.

Based on the Globocan cancer data from 2002 and 2008, we will age standardize and analyze descriptive statistics to assess the age specific distribution of breast cancer diagnosis and death in by developing country region and sub-region, level of country income, point in the epidemiological transition of countries (by stratifying countries according to stage using Murray/Lopez).

We have requested 5-year age-specific data from IARC from Globocan 2008 and have been told that these can be

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

made available. Although the 2002 and 2008 data are not comparable directly, we will seek to search for consistencies and inconsistencies between the two data sets and identify in each data set any patterns of outliers that might suggest errors in either set of projects as these are based on a small set of country registries.

We will work with the following variables: age at death, age at diagnosis, incidence, morality, incidence/mortality (the ratio of these two rates as an imperfect proxy for lethality or case fatality), as well as the differences between age at diagnosis and age at death. We will seek to identify countries, particularly in LAC, that have especially high or especially low levels of each of these variables, stratifying by basic variables such as level of country income, per capita health spending, proportion of the population living in poverty etcetera to identify outliers and countries that are particularly poor or good 'performers' or with particularly high or low rates, given their stage and level of development. This will provide input into the next part of the analysis as we can then ask what makes these countries different from others with reference to the determinants described below.

The results of this work will provide a stand-alone article on the distribution across developing countries of breast cancer age at diagnosis and age at death with a particular focus on how poverty is associated with each variable and with the probability of survival (using the above mentioned proxies.)

The quantitative research will be undertaken by demographers, epidemiologists, statisticians and health systems specialists on the research team who have worked extensively with these data and on demographic transition in the developing world and focused on LAC, including Drs. Lizbeth Lopez, Peggy Porter, Carmen Elisa Florez, Nancy Keating, Rebeca Wong and Felicia Knaul. Given the restrictions in these data, we will also work with: colleagues at IARC and those who created these data bases; experts who have studied under and mis-reporting of disease including colleagues at the Institute for Health Metrics and Evaluation, U. Washington (Dr. Rafael Lozano); and, the breast oncologist on the research team (Dr. Julie Gralow).

Part 2: *Determine the degree to which these can be explained by patterns and trends in demographic transition, family formation, reproductive health, nutrition, labor force participation and education, among others.*

Part 2. 1: The contribution of socio-economical, reproductive, environmental and nutritional factors to breast cancer mortality burden for LAC and other regions of the developed and developing world in 2008 (IARC-Globocan data), will be estimated through simple regression models as well as descriptive techniques to search for associations in an 'ecological model' or approach.

Among other additional sources of information, we will use those developed by the World Bank (World Development Indicators), the Inter-American Development Bank, WHO, PAHO and the UN (and its agencies), also data sets such as the Murray and Lopez burden of disease data and DHS surveys, as well as specific population surveys available in some Latin American countries. Important historical information and a guide to available data in each country and on trends is available in *Mujeres Latinoamericanas en cifras*.¹¹

Examples of the explicative variables to be considered include: adolescent and total fertility rate, birth rate, contraceptive prevalence (women ages 15-49), health expenditure (per capita, public and total), life expectancy at birth, malnutrition prevalence, height and/or weight for age (children under 5), maternal mortality ratio, ratio of girls to boys in primary and secondary education, teenage mothers, water pollution, urban population, prevalence of obesity and breastfeeding, total caloric intake, income (expenditure) per capita, percentage of households below poverty line (s), female labour participation, education of women (average years and level). We will also analyze changes over time and rates of change in these factors stratifying across countries by level of income. This analysis will be informed by the in-depth country analysis in Mexico and possibly Colombia where data exist on within-country changes over time about by population group (by income, sub region and ethnicity).

The work will be reviewed by the Expert Resource group including the leaders in the disease profile (Gralow), gender disparities and women and health in the developing world (Langer, Krishnan).

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Part 2.2: Further analysis will include the evaluation of age-period and cohort effects that may be related to differences in age patterns of breast cancer mortality in LAC countries (this type of analysis has been undertaken for Mexico by F Franco (a collaborator on this project who will lead this analysis) and Lopez (co-PI) and the results are published and provide reference for this proposed work).¹² Based on WHO mortality data base and using the information on breast cancer deaths, age adjusted breast cancer death rates for women aged 25 through 85 years and born between 1905 and 1975, will be calculated through the direct method using the most recent world population age distribution available.

Age (a), period (p) and cohort (p) curvature trends for breast cancer mortality (λ) will be estimated through the following Poisson Regression Age-Period-Cohort (APC) model, proposed by Holford (2008).¹³

$$\text{Log}\lambda_{(a,p,c)} = \mu + [\beta a + \beta p]a' + [\beta p + \beta c]c' + \alpha(a) + \pi(p) + \gamma(c)$$

(note equation is inserted above)

Where a' and c' are the curvature components of the age and cohort effects, μ is called the “net drift parameter” indicating the overall direction in which the mortality trend is moving, and α , π and γ are the parameters describing the age, period and curvature trends. The net drift parameter will be extracted using Holdford’s naïve average. The model will be fitted so that age effects will be presented as death rates for the reference cohort. Cohort effects represent death rate ratios relative to the reference cohort, whereas period effects are constrained to be 0 on average with 0 slope. The model will be fitted on a tabulation of deaths and populations using single-years of age and period to avoid overlapping cohorts and to give more detail to the trends. Natural splines with 7 parameters for the age, period and cohort terms will be incorporated in the APC modeling to reduce random variation due to the use of such detailed tabulation. All APC modeling will be performed using the implementation provided by Carstensen 2007 and in the R Statistical Package [R development core team, 2004].¹⁴

Part 3: *Project, under different scenarios of trends in demographics, family formation, reproductive health patterns, nutrition, labor force participation and education, breast cancer cases and deaths focusing on the LAC region.*

Based on the multivariate regression models that resulted from previous analysis (components 1 and 2.1) age at diagnosis and breast cancer death under different scenarios will be further studied based on the Globocan 2008 data and using the trends in the explicative variables mentioned above. Trends in demographics, family formation, reproductive health patterns, nutrition, labor force participation and education, holding constant health system inputs for diagnosis and treatment will first be considered. We will also consider different scenarios for specific population groups including younger versus older women, poorer populations and specific ethnic groups (in certain countries). We will then project possible changes in health system inputs for early diagnosis and treatment and discuss their potential impact.

Again, this will be based on published data on trends and levels from the World Bank, the Inter-American Development Bank, WHO, PAHO and the UN, and data sets such as the Murray and Lopez burden of disease data and DHS surveys, covering global population estimates and trends, disease patterns, education levels and risk factors, to model and project patterns of breast cancer onset and death using competing scenarios and criteria for risk factors.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Part 4: ***In-depth analysis of country-specific quantitative data for Mexico, Costa Rica, Dominican Republic and Colombia on age-distribution and determinants.***

The objective of this component is to produce more in-depth analysis of multiple aspects of research project building on the data available for each of the four countries. These will provide a richer analysis of the situation in each country and sub-region that will both inform and be informed by the comparative regional analysis in parts (1) - (3).

Some of the specific analysis to be undertaken will be defined in the first meeting of country-researchers early in Year 1 (following on the first Expert Resource group meeting). Based on the knowledge of existing data sets for each country the following analysis will be undertaken in Mexico (building on existing work from the Special Edition of Salud Pública de México. Cáncer de mama: un reto para la sociedad y los sistemas de salud. Vol 51, S 2, March 2009.):

- Determinants of the probability of mammography and BCE by state using the National Surveys of Health and Nutrition of 2000 and 2006 and data on the distribution of health inputs using administrative records
- Analysis of the distribution of age at diagnosis and age at death by stage of diagnosis in the Mexican Social Security Institute registry using panel data.¹⁵
- Updated analysis of the *Oportunidades* (Encel) data on early detection and use of health system in particularly poor populations and by ethnicity¹⁶

In the case of Colombia and Costa Rica, we will focus this work on analyzing trends over time in incidence, age at diagnosis and stage at diagnosis using the registry data – that dates back in both cases to the mid-1980s. In the case of Costa Rica, we will identify differences and trends by ethnicity and sub-regions.

The analysis from the Dominican Republic will be based more on a more limited set of data that include national surveys and hospital records of the two main cancer institutions. The study would also review national policy around breast cancer including new initiatives on financial protection of patients through the family health insurance, analyzing the legal coverage for treatment as well as the effective coverage in the public and private sector.

This part of the research project will produce stand-alone papers for each country, as well as additional insight to help explain the cross-country results. Further, and based on Year 1 results, the group will consider the possibility of producing a paper comparing results among the four countries with a special focus on recommendations for health care interventions for early detection and treatment, and for lessons learned in insuring the disease (see objective 6).

Part 5: ***Qualitative research to identify barriers to reporting and detecting the disease on both the supply (health system) and demand (patients and families) side.***

In each of the four countries, 1 focus group and a set of in-depth interviews with health care providers will be undertaken to better understand barriers that are faced by women and how these may affect age at detection (and late-stage detection). Through in-depth focus groups and interviews with key informants on the provider side and with women and families, in each of the four countries, factors that are difficult to measure in surveys such as stigma, discrimination and status of women will be addressed.

This will build on instruments and work undertaken in Mexico in 2008 and incorporates a patient-oriented perspective on the results. Dr. Gustavo Nigenda will co-coordinate this part of the work and will undertake a workshop for the four countries.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

In the case of Mexico, in order to document the differences between ethnic groups regarding the existing cultural, social and institutional barriers to access breast cancer health services, a set of focus groups will be carried out in the Southern State of Oaxaca, Mexico. This information will contribute to understanding late detection of breast cancer among these groups. Oaxaca is a State with a broad variety of indigenous groups speaking different languages and with a traditional understanding of health, disease and health care. In order to compare the differences in access half of the focus groups will be carried out in indigenous communities and the other half in non-indigenous communities. Dr. Nigenda has strong family ties – which will facilitate the organization and undertaking of the focus group with the state and he will be in charge of collecting and analyzing the information collected in Oaxaca.

Part 6: *Linking results and recommendations to analysis of the organization of health systems and health care inputs.*

This part of the work will involve an analysis of the organization of health systems and health system financing, with a specific focus on programs on women and health and norms and legislation around breast cancer. Again, this work will build on the Special Edition of Salud Pública de México, as well as using the results of a multi-country initiative to study health systems in LAC that has been undertaken by the INSP and Funsalud and as part of the LAC Health Observatory (see below) which will be completed and published for 19 LAC countries in November of 2010.

Mexico, Colombia and the DR- are particularly interesting as they have undertaken recent and extensive health reforms that include, but to differing degrees and in different ways, coverage of breast cancer in the packages of covered services. Costa Rica is an example of a country with near universal population coverage. The particular focus will be on analyzing the health systems reforms and organization that are making it possible to include the detection and treatment of breast cancer in social insurance packages in Mexico (Seguro Popular), Colombia, Costa Rica and the Dominican Republic.

Through an analysis of health system organization and coverage, including insurance and packages of services, we will identify how early detection and treatment is being achieved and how information on the age structure and determinants of the disease can inform better policy making.

* *Note:* Funsalud and the Harvard Global Equity Initiative have been in contact with IARC to request the 2008 Globocan data broken down by age groups. We have been informed that there should be no difficulty in getting these data for our research and we are awaiting a formal response and the details on the age breakdowns.

General and process:

The results will be debated and analyzed in two meetings of the inter-disciplinary team of researchers involved in the project including principal investigators, LAC country experts and key advisors. In order to facilitate a broader and on-going discussion, we will also work with tools such as WEBEX. In addition, one meeting of the in-depth country researchers will be undertaken that will include a 1-day workshop on qualitative methods led by Dr. Gustavo Nigenda, and a day of interaction with the project co-PIs to guarantee comparability of cross-country results, maximise input from the in-depth country research to inform the regional and global analysis, and identify areas and opportunities for influencing policy, improving registry and other data and contributing to local advocacy. Through networks such as the Breast Health Global Initiative, UICC, the American Cancer Society (Latina Mama), the LAC

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Health Observatory (run from Funsalud) and outreach to institutions such as the Susan B Komen Foundation, as well as existing international contacts with colleagues and institutions in a variety of developing countries in other regions, we hope to share the results of the research. We will also actively seek to build on the work on LAC and generate additional interest and funding for in-depth research in other regions of the developing world.

3.5: KEY MILESTONES/MAJOR RESEARCH TASK

Describe the work to be done as a series of major research tasks, in significantly more detail than in the LOI. Milestones are specific dates and stages of the research project. (In your Budget Form, you should also identify the funding requirements based upon these research milestones.)

Year I:

I. Expert Resource Group and researchers:

Month 1-2: Identify all researchers and assistants and set up communication and links.

Measures: list of participants and google group

Month 1-3: Establish working relationship among researchers in group.

Measures: Are key disciplines represented and reflected in research design.

Participation in 1-2 webex meetings and through comments on research design.

Every 4-6 weeks:

1 webex or conference call meeting (other than month with an in-person meeting).

II. Project management

Upon receiving word if proposal is accepted, and Month 1-2: IRB through the National Institute of Public Health of Mexico including all project components and covering all aspects of research included in this proposal.

Measures: certificates of approval for research with populations and exemption for use of official survey and administrative data.

Month 1-2: Set up financial and reporting structures including sub-contracts from Funsalud to all research partner institutions.

Measures: contracts in signature process.

Ongoing: Financial and substantive reporting on progress and management of sub-contracts from Funsalud to all research partner institutions.

Measures: regular payments to participants against products. preparation of interim reports.

III. Framework for study and design and data collection

Month 1-3: Data bases obtained and set up for analysis (including Globocan 2008 by 5-year age groups)

Measure: Data bases.

By Month 3: Refine research design and establish key definitions in preparation for first in-person meeting.

Measure: methodology summary document.

Month 3-4: Meeting of in-country researchers.

Measure: Agenda, list of research components and areas of collaboration.

Month 4-5: In person meeting of Expert Resource Group and researchers in Mexico or Boston.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Milestone: Finalize all aspects of research design and key definitions, and provide input to research planned in Colombia, CR, DR and Mexico. Review initial results of analysis of Globocan 2002 and 2008 age distributions. Agree on plan for working papers to be produced with author groupings. Finalize framework and methodologies for identifying and differentiating between risk factors and determinants of age of onset, diagnosis and mortality.
Measure: meeting agenda, list of attendees and summary of key points and decisions.

IV. Global and regional analysis

Month 1- 6: Collate key data sources and identify additional sources particularly in the 4 country cases and regionally on the disease profile and women and health.

Measure: list of data sources. Have all available country-specific and global data sets in place and ready for analysis.

By Month 6-7: Analyze age distributions for diagnosis and death based on Globocan 2002 and 2008.

Measure: powerpoint presentation and draft working paper as follow-up to Meeting 1 of Expert Resource Group.

By Month 12: Analysis of age distributions for diagnosis and death based on Globocan 2002 and 2008.

Measure: final draft of working paper to be approved by Expert Resource Group for journal submission in Year 2.

By Month 6-7: Framework for analysis of global risk factors and determinants.

Measure: powerpoint presentation and draft working paper as follow-up to Meeting 1 of Expert Resource Group including description and basic analysis of sources of global data on determinants.

By Month 12: Analysis of global risk factors and determinants of distributions for diagnosis and death based on Globocan 2002 and 2008.

Measure: draft 2 of working paper.

Month 12: Papers.

Milestone: two working papers.

V. In-Depth analysis in 4 countries

By Month 4: Develop and refine design for 4 case studies including interview guides (focus group and in-depth interviews)

Measure: Summary document of study design for each country interview guides for presentation at Meeting 1 of Expert Resource Group.

By Month 7: Apply first round of key informant interviews in at least 2 countries.

Measure: results of interviews.

Month 6-12: Registry data in Cali and Costa Rica.

Measure: summary note of findings for interim report.

By Month 12: Apply all key informant interviews and undertake first round of focus groups in Mexico.

Measure: summary report from each country.

VI. Dissemination and discussion of results

Ongoing: Disseminate and discuss project and results.

Measures: participate in at least 1 international academic meeting and 1 local seminar; post project information and first results on websites of all institutional project participants; reach out to networks such as GTF.CCC, UICC, BHGI, Observatorio de la Salud; identify potential partners and donors for work in Asia and other interested developing countries and regions.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Note: All results summarized in YEAR 1 progress report.

Year 2:

I. Expert Resource Group and researchers (general):

Every 4-6 weeks:

1 webex or conference call meeting (other than month with an in-person meeting).

Month 17-18: Second in person meeting of Expert Resource Group and researchers in Mexico or Boston.

Milestone: Review all research results including in-depth country work in Colombia, CR, DR and Mexico.

Finalize publication plans and co-authorships, dissemination strategies and next steps for future research.

Measure: meeting agenda, list of attendees and summary of key points and decisions.

II. Global and regional analysis

By Month 14: Analyze age distributions for diagnosis and death based on Globocan 2002 and 2008.

Measure: international journal submission.

Month 12-18: Analysis of global risk factors and determinants of distributions for diagnosis and death based on Globocan 2002 and 2008.

Measure: final draft of paper for submission to journal and submission to international journal.

Month 12-24: In-depth work on particular blocks of risk factors and determinants such as gender violence and access to interventions and health systems.

Measure: at least 2 working papers by end of project for later submission to local and international journals.

III. In-Depth analysis in 4 countries

By Month 14: Complete all interviews

Measure: Summary reports as background and input into paper on analysis of risk factors and determinants.

By Month 18: Complete all analysis.

Measure: summary report from each country.

Month 14-20: Presentations of results in-country.

Measure: Summary report, agenda, press clippings.

Month 16-22: Write-up of results and production of final country papers.

Measure: 4 country papers in final draft for submission to local and international journals. 4 policy briefs summarizing results for each country.

Month 18-23: Write-up of regional results and recommendations for LAC

Measure: 2 policy briefs (including recommendations for registries and data collection). 1 comparative paper in draft.

IV. Dissemination and discussion of results

Ongoing: Disseminate and discuss project and results.

Measures: participate in at least 2 international academic meetings and 4 local seminars and dissemination meetings; post project information and working papers on websites of all institutional project participants;

share results with networks such as GTF.CCC, UICC, BHGI, Observatorio de la Salud; solidify next steps and

extension of analysis with partners and donors for work in Asia and other interested developing countries and

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

regions.

By month 18: Have available on web data bases where permission has been granted for public use.

Measure: Data bases on web site.

V. Project management

Ongoing: Financial and substantive reporting on progress and management of sub-contracts from Funsalud to all research partner institutions.

Measures: regular payments to participants against products; preparation of interim reports.

Month 10-12: Final report - financial and substantive and project closure.

Measure: final report.

Month 23-24: Milestone: Final report and submission of all products including 6-10 research papers and 6 policy briefs and reports from international and local dissemination.

3.6 REFERENCES

Provide a complete list of references as may be cited within this application. Actual references are not required, but the PI should be prepared to provide electronic and/or hard copies of the original references upon request. Original references do not have to be in English, if they are in other languages.

*** References are attached as a separate word document, entitled: GSK ERI Grant References, July 15 2010 final

3.7: RESEARCH TEAM & COLLABORATORS

Key personnel, research team members, and collaborators who will be involved in the project. Fill in, their name(s), role(s) in the project and affiliated Institution/Organization.

Name	Role in Project	Institution/Organization
* Indicates Biosketch attached for this researcher. Biosketches re available for all collaborators.		
Knaul, Felicia	Principal Investigator	Mexican Health Foundation, Mexico City, Mexico Harvard Global Equity Initiative; Harvard Medical School , Boston, USA
López-Carrillo Lizbeth	Co-Principal Investigator	Mexico National Institute of Public Health, Mexico City, Mexico
Arreola-Ornelas, Hector*	Research coordinator for project; co-coordinator of the Mexico research; input into regional analysis in health economics, organization of health systems and analysis of Globocan data. Will co-write a paper on Mexico with FKnaul and O Mendez.	Mexican Health Foundation, Mexico Cáncer de mama: Tomatelo a pecho, Mexico
Florez, Carmen Elisa	Participate in the Expert Working Group, in: 1) demographic analysis, 2) age-cohort analysis and 3) health systems analysis for LAC. Co-author papers on age and determinants of detection and diagnosis. Participate in Colombia in-depth country analysis and co-author paper.	Universidad de los Andes Colombia
Gralow Julie*	Participate in the Expert Working Group, in: 1) analysis and understanding of disease profile, evolution and treatment of BC as a clinical oncologist, 2) analysis of registry data, 3) role of advocacy and awareness building and 4)	Seattle Cancer Care Alliance, US

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

	translation of results to global messages and recommendations. Co-author papers on age and determinants of detection and diagnosis.	
Guerrero Carvajal, Ramiro*	Participate in the Expert Working Group as in policy formulation, and on health systems analysis; lead in-depth analysis in Colombia, coordinate analysis of the Cali registry and lead Colombia paper. Co-author papers on age and determinants of detection and diagnosis.	Center for Health Economics, Fundación Valle del Lili and Universidad ICESI, Cali, Colombia
Keating, Nancy*	Participate in the Expert Working Group, in: 1) analysis of registry data, and 2) analysis of how health care systems impact delivery and hence age of detection of BC in regional analysis and in-depth country work. Co-author papers on age and determinants of detection and diagnosis.	Harvard Medical School and Brigham and Women's Hospital, US
Krishnan, Suneeta	Participate in the Expert Working Group, on: 1) impact of gender discrimination and factors such as machismo in determining age of diagnosis of BC, and 2) potential to apply and expand analysis in the Asia region. Co-author papers on age and determinants of detection and diagnosis.	St. John's Research Institute, Bangalore, India.
Langer, Ana	Participate in the Expert Working Group, on: 1) impact of gender in determining age of diagnosis of BC, 2) organization of health systems in LAC 3) policy and analysis and role of reproductive and maternal child health programs in promoting early detection in the future, 4) in-depth country analysis interacting with local research teams and 5) translation of LAC results to global messages and recommendations. Co-author papers on age and determinants of detection and diagnosis.	Harvard School of Public Health as of August 2010 (Formerly Engenderhealth)
Nigenda, Gustavo Humberto*	Participate in the Expert Working Group as expert in health systems, women and health and qualitative research; lead in-depth qualitative analysis in Mexico, and co-coordinate in-depth country analysis of Mexico with Knaul, Lopez and Arreola; co-author Mexico papers, Participate in the Expert Working Group; Co-author papers on age and determinants of detection and diagnosis.	National Institute of Public Health, Mexico; Cáncer de mama: Tomatelo a Pecho, Mexico
Porter, Peggy*	Participate in the Expert Working Group, in: 1) analysis of registry data, 2) analysis of Globocan data for 2002 and 2008, 3) translation of LAC results to global messages and recommendations. Co-author papers on age and determinants of detection and diagnosis.	Seattle Cancer Care Alliance, US
Rathe, Magdalena *	Participate in the Expert Working Group as expert in national health accounts and health economics; lead in-depth analysis in the Dominican Republic and lead paper on the Dominican Republic; Co-author papers on age and determinants of detection and diagnosis.	Fundación Plenitud, Dominican Republic
Saenz, Rocio*	Participate in the Expert Working Group as expert in policy formulation in LAC and especially sub-region CA, and on health systems analysis; lead in-depth analysis in Costa Rica, coordinate analysis of the Costa Rica registry and lead Costa Rica paper; Co-author papers on age and determinants of detection and diagnosis.	School of Public Health, University of Costa Rica; Consultores en Desarrollo, Sociedad y Administración, Costa Rica

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Walker, Dilys*	Participate in the Expert Working Group in: 1) early detection of breast cancer, 2) women and health, 3) maternal health outreach, education and awareness building in LAC.	INSP, Associate researcher; School of Public Health, University of Washington, US; Practicing OBGYN.
Wong, Rebeca*	Participate in the Expert Working Group, in: 1) demographic analysis, 2) population aging, 3) determinants of health disparities in hispanic populations and LAC, and 4) health care utilization in LAC. Co-author papers on age and determinants of detection and diagnosis. Participate in Mexico in-depth country analysis and co-author paper.	WHO/PAHO Collaborating Center on Aging and Health, University of Texas Medical Branch.
Partial list of Additional Collaborators		
Bhadelia, Afsan	Liaison to the GTF.CCC and Harvard University and US-based collaborators; input into policy analysis and international projection of recommendations	Harvard Global Equity Initiative, US
Franco, Francisco	Epidemiologist (PhD). Age-cohort analysis, Research support and data analysis, and write-up working with Lizbeth Lopez	National Institute of Public Health, Mexico
Méndez, Oscar	Data analyst for surveys, cross-country analysis and Globocan data	Mexican Health Foundation, Mexico
Ortega, Sonia	Meeting logistics, project management, interinstitutional collaboration, publications and dissemination	Mexican Health Foundation, Mexico; Cáncer de mama: Tómatelo a pecho, Mexico
Torres, Luisa	Epidemiologist. Research support and data analysis, and write-up working with Lizbeth Lopez-Carrillo.	National Institute of Public Health, Mexico
Goldsmith, Jennifer	Logistics of meetings and project management. Liaison to the GTF.CCC and Harvard University and US-based collaborators in Year 2 of project.	Harvard School of P Public Health, US

3.8: RESOURCES & OTHER REGULATORY COMPLIANCE

Resource Support:
What are the resources (manpower, lab facilities, and others) will be used to support this research?

The resources of FUNSALUD and INSP that will be utilized for this project include a computer lab facility, software for analyzing data, electronic and library resources, research assistants, administrative personnel, as well as the research hours that will be invested by the researchers involved in the project. INSP will provide administration of the IRB process. The institutions of each of the researchers will provide space, communication and computing facilities.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Regulatory Assurances:

What are the regulatory or other compliance requirements that need to be adhered to that not otherwise explained above, e.g. what may be specifically required by your government, other assurances that the PI needs to provide to do the research in his/her country and/or institution?

According to Mexican fiscal and research law, the organization (FUNSALUD) must be registered as a research organization and also as a non-profit organization in order to accept funding for projects. FUNSALUD is up to date on its registration.

Research registration number: RENIECYT: 2006/358

Non-profit registration number: INDESOL: 05-09-1-1229CLUNI: FMS8506220910D

Subjects and Substances:

What animal and/or human subjects, biological or anatomical substances (including biopsies of tumors, blood samples etc.) are to be used in the Research Project?

Not applicable.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3.9: BIOGRAPHICAL SKETCH
Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

Biographical sketches are included for core members of the research team and are available for all collaborators.

<i>Name:</i> Arreola-Ornelas, Héctor	<i>Position/Title:</i> Coordinator of Economic Research Mexican Health Foundation		
<i>Education/Training</i>			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
Instituto Tecnológico Autónomo de México	Bachelor of Science	1992-97	Economics
Center of Economic Research and Teaching CIDE, National Institute of Public Health	MA	1997-1999	Health Economics
<i>Research and Professional Experience:</i> Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.			
<u><i>Employment:</i></u> 1995 – 1996 Analyst. National Commission of Insurance and Deposits 1997 – 1999 Research Assistant. Center of Economic Research and Teaching. CIDE 1999 – 2000 Associated Researcher. National Institute of Public Health. 2000 – 2003 Chief of Health Economics Unit. Mexican Institute Of Social Security 2003 Coordinator of Economic Research. Mexican Health Foundation			
<u><i>Honors:</i></u> 1992 Student Grant: Alberto Bailleres. Best test score on admission paper 1992 for the Instituto Tecnológico Autónomo de México. 1999 Best Student of Class 1997-1999. Master in Health Economics. Center of Economic Research and Teaching. CIDE			
<u><i>Government, Public Advisory Committee or other similar Service:</i></u> 1994 – 1996 Assistant Lecturer. Instituto Tecnológico Autónomo de México. 1996 – 1997 Research Assistant. Instituto Tecnológico Autónomo de México. 1999 – 2000 Lecturer. Universidad la Salle, Campus Cuernavaca. 2000 – 2003 Associated Researcher. Mexican Health Foundation			
<u><i>Publications (recent & most relevant):</i></u> 1. Knaul FM, Arreola-Ornelas H , Velázquez E, Dorantes J, Méndez O, Ávila-Burgos L. El costo de la atención médica del cáncer mamario: el caso del Instituto Mexicano del Seguro Social. <i>Salud Pública de México</i> 2009; Vol. 51 suppl 2:S286-S295.			

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Age of onset of breast cancer in Latin America and the Caribbean: a

Research Title: multidisciplinary approach to understanding determinants and health policy implications

2. Knaul FM, Nigenda G, Lozano R, **Arreola-Ornelas H**, Langer A, Frenk J. "Breast Cancer in Mexico: a pressing priority." *Reproductive Health Matters*. Vol. 16 (32), Nov 2008. 113-123.
 3. Knaul FM, **Arreola H**, Méndez O, Miranda M. (2009). "Preventing impoverishment, promoting equity and protecting households from financial crisis: Universal Insurance through Institutional Reform in Mexico". In "Addressing Challenges of Health Systems in the Developing World". Peter Smith and Diana Pinto, editors. Global Development Network and Edward Elgar.
 4. Knaul FM, **Arreola-Ornelas H**, Méndez-Carniado O, et al. (2006). "Evidence is good for your health system: policy reform to remedy catastrophic and impoverishing health spending in Mexico." *The Lancet* 2006; 368(9549): 1828-1841.
 5. Knaul FM, **Arreola-Ornelas H**, Méndez-Carniado O, Torres AC. (2007). "Impoverishing and catastrophic household health spending among families with older adults in Mexico: A health reform priority." Chapter 18. *The Health of Aging Hispanics: The Mexican-Origin Population*. Angel, JL, Whitfield KE. (Eds.). New York: Springer Publishing. Principal Investigator/Program Director (Last, First, Middle): PHS 398/2590 (Rev. 05/01)
- Additional recent publications of importance to the field (in chronological order)**
1. Knaul FM, Nigenda G, Lozano R, **Arreola-Ornelas H**, Langer A, Frenk J. Cáncer de mama en México: una prioridad apremiante. *Salud Pública de México* 2009; Vol. 51 suppl 2:S335-S344.
 2. Knaul FM, **Arreola-Ornelas H**, Escandón P (2007). "La competitividad, la salud y el sector salud: Una nueva vertiente del paradigma de economía y salud." *Gaceta Médica de México*.
 3. Knaul FM, **Arreola-Ornelas H**, Méndez-Carniado O, Bryson-Cahn C, Barofsky J, Maguire R, Miranda M, Sesma S. "Las evidencias benefician al sistema de salud: reforma para remediar el gasto catastrófico y empobrecedor en salud en México". In Knaul FM, Horton R, (Eds.) *Suplemento: La reforma del sistema de salud mexicano*. México, D. F.: Salud Pública de México 2007, Vol. 49 (suppl 1):S70-S87.
 4. Valenzuela-Flores AG, Valenzuela-Flores AA, **Arreola-Ornelas H**, et al. Costo-efectividad de los estudios de gammagrafía miocárdica e impacto al gasto total por diagnóstico de cardiopatía isquémica. *Cir Ciruj* 2006;74:175-181.
 5. Knaul F, **Arreola H**, Méndez O. (2005). "Protección Financiera en Salud: México, 1992 a 2004". *Salud Pública de México*. Vol 47 (6), Nov-Dec: pp 430-439.
 6. Knaul F, **Arreola H**, Méndez O, Martínez A. (2005). La justicia financiera y los gastos catastróficos en salud: el impacto esperado de la extensión del Seguro Popular de Salud en México. *Salud Pública de México*. Vol. 47, suppl 1: pp. 53-64.
 7. Van Doorlaer E, Masseria C and The OECD Health Equity Research Group Members; Por México: Nigenda G y **Arreola H**. Income-related inequality in the use of medical care in 21 OECD countries. En *Toward High-Performing Health Systems*. OECD, Paris, 2004.
 8. Knaul F, **Arreola H**, Borja C, Méndez O, Torres AC y Frenk J. El Sistema de Protección Social en Salud de México: Impacto en la Justicia Financiera y sobre los Gastos Catastróficos en Salud de Los Hogares. En *Caleidoscopio de la Salud*. FUNSALUD. México, D.F., 2003.
 9. **Arreola H**, Soto H y Garduño J. Los Determinantes de la No Demanda de Atención en México. En *Caleidoscopio de la Salud*. FUNSALUD. México, D.F., 2003.
 10. Felicia Knaul, Oscar Mendez, CJL Murray, **Héctor Arreola**, Juan Pablo Ortíz, Ana Cristina Torres, Julio Frenk, "The Impact of Extending Universal Prepaid Coverage on Fairness of Financial Finance and Catastrophic Health Expenditures in Mexico", en "Health system Performance: Concepts, Measurements and Determinants". Organización Mundial de la Salud, Ginebra, 2001.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3.9: BIOGRAPHICAL SKETCH			
<i>Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.</i>			
<i>Name:</i> Ramiro Guerrero Carvajal		<i>Position/Title:</i> Research Director	
<i>Education/Training</i>			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
Harvard University – Department of Economics	Masters (Joint degree)	2007	Econometrics Courses ECON 2120-2130
University of Maryland – Universidad de los Andes (Colombia)		2000	Environmental Economics
Universite d’Auvergne (France)	Masters	1998	Economic Policy
Universidad de los Andes (Colombia)	B.A.	1997	Economics
Research and Professional Experience: <i>Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.</i>			
<p>Employment: Harvard Global Equity Initiative - Research Director – February 2009 to present Harvard Initiative for Global Health - Research Fellow– February 2007-2009 Ministry of Social Protection – Colombia –Deputy Minister- July 2004-January 2007 Fedesarrollo – Colombia – Research Associate –January-July 2004 SEMANA magazine-Colombia- Economics Editor (June 2000-January 2004) Fedesarrollo – Colombia – Researcher –February 1999-June 2000 OECD Development Center – Paris- Research Assistant – September 1998-January 1999</p> <p>Honors: Government, Public Advisory Committee or other similar Service: Member of Technical Advisory Committee on Vaccines Policy- Pan American Health Organization Member of Latin American and the Caribbean Health Observatory (LAC) Coordinator of Research Network on Effective Coverage of Health Services- LAC Observatory Coordinator of Colombian chapter of LAC Observatory</p> <p>Publications “Conducting Economic Evaluations” in “Methodological Guidelines for Developing Health Care Guidelines for the Colombian Social Health Insurance System”– Colombia – Ministry of Social Protection & Colciencias -2010 (ISBN “Are health systems responding effectively to the growing diabetes epidemic? An analysis of seven national health</p>			

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

examination surveys” (coauthor, with E.Gakidou C.Murray et al.), 2010, Submitted to WHO Bulletin.

“Effective Coverage of Health Services in Colombia” (editor) Observatorio de la Salud de América Latina y el Caribe, 2010.

“Effective Coverage of Health Services in Colombia”, in “Comparative Effective Coverage in Latin America”, Observatorio de la Salud de América Latina y el Caribe, 2010.

“Financing Universal Enrollment to Social Health Insurance: Lessons Learned from Colombia,” Well-Being and Social Policy, Vol 4 No. 2, 2008, Mexico.

3.9: BIOGRAPHICAL SKETCH
Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

<i>Name:</i> Gralow, Julie R.		<i>Position/Title:</i> Professor, Medical Oncology	
<i>Education/Training</i>			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
Stanford University	BS	06/81	Biological Sciences
University of Southern Ca. School of Medicine	MD	06/88	Medicine
Brigham and Women’s Hospital, Harvard Medical School	residency	06/91	Internal Medicine
University of Wa. School of Medicine	fellowship	6/94	Medical Oncology

Research and Professional Experience: Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.

Employment:

7/09-present	<u>Professor.</u> Department of Medicine, Division of Oncology. University of Washington School of Medicine.
9/07-present	<u>Director.</u> Breast Medical Oncology. Department of Medicine, Division of Oncology. University of Washington School of Medicine.
7/06-present	<u>Associate Member.</u> Fred Hutchinson Cancer Research Center, Clinical Division.
7/02-6/09	<u>Associate Professor.</u> Department of Medicine, Division of Oncology. University of Washington School of Medicine.
7/01-present	<u>Associate Program Head.</u> Breast Cancer Program, Fred Hutchinson Cancer Research Center
1/98 - 2002	<u>Assistant Professor.</u> Department of Medicine, Division of Oncology. University of Washington School of Medicine.
1/98 - 2002	<u>Director.</u> University of Washington Women’s Cancer Genetics and Risk Reduction Clinic.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

1/98 - 2002 Director. Patient and Physician Education and Outreach. University of Washington Cancer Center.
 1/99 - 7/06 Assistant Member. Fred Hutchinson Cancer Research Center.
 7/94 - 12/97 Acting Instructor. Department of Medicine, Division of Oncology. University of Washington School of Medicine.
 7/91 - 6/92 Staff Internist. Harvard Community Health Plan. Boston, Massachusetts.

Honors:

Fellow, American College of Physicians, elected 2008
 American Society of Clinical Oncology Statesman Award 2008
 University of Washington Medical Center Service Excellence Award 2008
 NCI Certificate of Appreciation for Significant Contributions as Co-Chair of NCI's State of the Science Conference on Preoperative Therapy in Breast Cancer 2007
 Susan G. Komen Breast Cancer Foundation, Puget Sound Affiliate, Community Service Award 2007
 Helen H. Jackson "Women of Valor" Award for Medicine and Health Care, Washington State 2006
 "Above and Beyond" Award, The Breast Care Site, December 2005
 Susan G. Komen Breast Cancer Foundation, Puget Sound Affiliate, Outstanding Community Volunteer Award, 2005
 University of Washington Continuing Medical Education Outstanding Faculty Award, 2000
 Coping Magazine Honorary Hero 1999
 American Cancer Society Clinical Career Development Award 1995-98
 American Society of Clinical Oncology Career Development Award 1995-1998
 Upjohn Outstanding Oncology Fellow Award 1994

Government, Public Advisory Committee or other similar Service:

1995-present Medical Director and Team Physician, Team Survivor Northwest
 1996-present Director, American Cancer Society/UW Medical Student Research Fellowship Program
 2000-present Vice-Chair, Southwest Oncology Group Breast Cancer Committee
 2001-2007 Chair, Medical Advisory Board, Expedition Inspiration Fund for Breast Cancer
 2002-2004 Member, University of Washington Faculty Senate
 2002-present Member, Fred Hutchinson Cancer Research Center Scientific Steering Committee
 2005-2009 Member, American Society of Clinical Oncology Communications Committee; Chair 2007
 2005-present Co-Chair, Breast Scientific Leadership Council, Coalition of Cancer Cooperative Groups
 2007-present Elected, Member, American Society of Clinical Oncology Nominating Committee

Research Support:

R01CA124573-03 Mankoff (PI) 12/1/06 - 11/30/11
 PET to Measure Breast Cancer Bone Metastasis Response
 To expand on preliminary studies of FDG and fluoride PET in patients with bone-dominant breast cancer undergoing systemic therapy with the goals of (1) prospectively validating FDG PET as a biomarker of breast cancer bone metastasis response and (2) measuring the relationship between tumor properties and adjacent bone turnover to direct effective diagnosis and therapy and assess risk of skeletal complications. Role: Co-PI

Breast Cancer Research Foundation Galow (PI) 11/30/07 - 9/30/11
 Support for the Southwest Oncology Group Ongoing Trials
 To provide support for multiple ongoing SWOG trials, including the S0307 study of adjuvant bisphosphonates in breast

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

cancer, the study evaluating serial serum tumor marker testing in Stage II-II patients, the S0316 trial evaluating barriers to accrual to clinical trials, and a tissue microarray resource for the Southwest Oncology Group's breast committee. Role: PI

R01 LM009143-02 Pratt (PI) 12/1/07 – 11/30/10

Managing Health Information In Your Life

To understand patients' information management work, to develop new technology that will support that work; evaluate the effectiveness of our new technology in helping patients manage their personal health information, participate in their own health care, and maintain their daily life activities. Role: Collaborator

U24 CA 126476-01 Carr (PI) (UW subcontract Gralow) 11/01/06 – 10/31/11

Measuring Cancer Biomarker Candidate by Targeted MS and Ab Enrichment

A network of five Clinical Proteomic Technology Assessment for Cancer teams will evaluate proteomic platforms and analysis-software in the context of potential applicability to cancer. Role: Collaborator

Novartis/NCI Canada Gralow (PI) 3/01/09-12/31/11

LISA Trial (Lifestyle Intervention Study in Adjuvant Treatment of Early Breast Cancer)

To evaluate a centrally delivered, telephone-based individualized lifestyle intervention compared to a mailed educational intervention on DFS in women with early stage breast cancer receiving letrozole. Role: Steering Committee Member and Institutional PI

U01 AR0579971-01 Potosky, Moinpour (PIs) 09/01/09 – 08/31/13

Validation of Patient-Reported Outcomes Measurement Information System (PROMIS) in Diverse Populations

To evaluate research methods being developed by the NIH-funded Patient Reported Outcomes Measurement Information System (PROMIS) to measure depression and fatigue as well as physical and social function. The project will compare how well these methods perform across four race/ethnic and two age groups in a large number of cancer patients. Results will guide revision of the measures to improve usefulness for clinical trials research and the monitoring of population health disparities. Role: Consultant

1 P50 CA138293-01A1 Porter (PI) 9/1/10 – 8/31/15

Breast Cancer SPORE, Clinical Core

To positively impact breast cancer prevention, detection, treatment and care of women who have, or are at risk for, the disease via facilitation of highly translational research. The Clinical Core will incorporate a highly-effective breast cancer clinical trials team into the overall structure of the SPORE. Role: Clinical Core Lead.

NIH/NCI PAR-08-045 Andersen (PI) 8/1/10 – 3/31/15

Breast Cancer Integrative Oncology: Prospective Matched Controlled Outcomes Study

To describe IO care as provided in community clinics and provide an initial evaluation of the effects of IO care and CAM use on breast cancer patients' Health Related Quality of Life (HRQOL). Role: Data Safety Monitor

U10 CA32102-24 Baker (PI) 4/01/04–12/31/15

Southwest Oncology Group Core Grant: 2 subcontracts

1) Breast Committee Vice-Chair: To oversee the design, implementation and conduct of trials in the SWOG Breast Committee. Role: PI

2) Southwest Oncology Group S0307: A Comparison of three bisphosphonates as adjuvant treatment of breast cancer. Role: PI

Publications (recent & most relevant):

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

1. Disis ML, Bernhard H, **Gralow JR**, Hand SL, Emery SR, Calenoff E, Cheever MA. Immunity to the HER-2/*neu* Oncogenic Protein. In Vaccines Against Virally Induced Cancers, Ciba Foundation Symposium No. 187, John Wiley & Sons, Inc., 198-211, 1994.
2. McTiernan A, Kumai C, Bean D, Schwartz R, Ulrich C, Mahloch J, Hastings R, **Gralow J**, Potter J. Anthropometric and Hormone Effects of an 8-week Exercise-Diet Intervention in Breast Cancer Patients: Results of a Pilot Study. *Cancer Epidemiology, Biomarkers, Prevention* 7:477-481, 1998.
3. Bowen D, McTiernan A, Burke W, Powers D, Pruski J, Durfy S, **Gralow J**, Malone K. Participation in breast cancer risk counseling among women with a family history. *Cancer Epidemiol Biomarkers Prev* 8(7):581-585, 1999.
4. McTiernan A, **Gralow J**, Talbott L. *Breast Fitness: An Optimal Exercise and Health Plan for Reducing your Risk of Breast Cancer*. St. Martin's Press, 2000.
5. Wilkie DJ, Huang HY, Berry DL, Schwartz A, Lin YC, Ko NY, Chen C, **Gralow J**, Lindsley K, Fitzgibbon D. Cancer symptom control: Feasibility of a tailored, interactive computerized program for patients. *Fam Community Health* 24:48-62, 2001.
6. **Gralow JR**. Evolving role of bisphosphonates in women undergoing treatment for localized and advanced breast cancer. *Clin Breast Ca* 5 Suppl 2:S54-62, 2005.
7. Hudis CA, Vogel CL, **Gralow JR**, Williams D. Weekly epoetin alfa during adjuvant chemotherapy for breast cancer: Effect on hemoglobin and quality of life. *Clin Breast Cancer* 6:132-142, 2005.
8. Bowen DJ, Fann JR, Andersen MR, Rhew IC, **Gralow JR**, Lewis FM, Hunt JR, Palomares M, Moinpour CM, Ankerst DP. Recruiting patients with breast cancer and their families to behavioral research in the post-HIPAA period. *Oncol Nurs Forum* 34(5): 1049-1054, 2007.
9. **Gralow JR** (editor). *Finding Your Way to Wellness: A Puget Sound Breast Cancer Information and Resource guide: Third Edition*. Published by Susan G. Komen Breast Cancer Foundation. 2007.
10. **Gralow JR**. Bone density in breast cancer: When to intervene? *J Clin Oncol* 25(22): 3195-3197, 2007.
11. **Gralow JR**, Tripathy D. Managing Metastatic Bone Pain: The Role of Bisphosphonates. *J Pain Symptom Manage*, 33:462-272, 2007.
12. **Gralow JR**, Zujewski JA, Winer E. Preoperative therapy in invasive breast cancer: reviewing the state of the science and exploring new research directions. *J Clin Oncol* 26:696-7, 2008.
13. **Gralow JR**, Burstein HJ, Wood W, Hortobagyi GN, Gianni L, von Minckwitz G, Buzdar AU, Smith IE, Symmans WF, Singh B, Winer EP. Preoperative therapy in invasive breast cancer: pathologic assessment and systemic therapy issues in operable disease. *J Clin Oncol* 26:814-9, 2008.
14. Lewis FM, Cochrane BB, Fletcher KA, Zahlis EH, Shands ME, **Gralow JR**, Wu SM, Schmitz K. Helping her heal: A pilot study of an educational counseling intervention for spouses of women with breast cancer. *Psychooncology* 17:131-7, 2008.
15. Syrjala KL, Abrams JR, Polissar NL, Hansberry J, Robison J, Dupen S, Stillman M, Fredrickson M, Rivkin S, Feldman E, **Gralow J**, Rieke JW, Raish RJ, Lee DJ, Cleeland CS, Dupen A. Patient training in cancer pain management using integrated print and video materials: A multisite randomized controlled trial. *Pain* 135:175-86, 2008.
16. Fann JR, Thomas-Rich AM, Katon WJ, Cowley D, Pepping M, McGregor BA, **Gralow J**. Major depression after breast cancer: a review of epidemiology and treatment. *Gen Hosp Psychiatry* 30:112-126, 2008.
17. Koon K, Soldak T, **Gralow J**. Breast Cancer Advocacy: Changing Perceptions. *Salud Publica de Mexico* 51: 323-328, 2009.
18. **Gralow JR**, Biermann JS, Farooki A, Fornier MN, Gagel RF, Kumar RN, Shapiro CL, Shields A, Smith MR, Srinivas S, Van Poznak CH. NCCN Task Force Report: Bone Health in Cancer Care. *J Natl Compr Canc Netw*. 7 Suppl 3:S1-S32; quiz S33-S35, 2009.
19. Body JJ, Lipton A, **Gralow J**, Steger GG, Gao G, Yeh H, Fizazi K. Effects of denosumab in patients with bone metastases,

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

with and without previous bisphosphonate exposure. J Bone Miner Res. 2009.

20. Muss HB, Berry DA, Cirincione CT, Theodoulou M, Mauer AM, Kornblith AB, Partridge AH, Dressler LG, Cohen HJ, Becker HP, Kartcheske PA, Wheeler JD, Perez EA, Wolff AC, **Gralow JR**, Burstein HJ, Mahmood AA, Magrinat G, Parker BA, Hart RD, Grenier D, Norton L, Hudis CA, Winer EP; CALGB Investigators. Adjuvant chemotherapy in older women with early-stage breast cancer. N Engl J Med. 360(20):2055-65, 2009.
21. Specht J, **Gralow JR**. Neoadjuvant chemotherapy for locally advanced breast cancer. Semin Radiat Oncol. (4):222-8, 2009
22. Jotwani AC, **Gralow JR**. Early detection of breast cancer: new biomarker tests on the horizon? Mol Diagn Ther 13(6):349-57, 2009.
23. Sparano JA, Hortobagyi GN, **Gralow JR**, Perez EA, Comis RL. Recommendations for research priorities in breast cancer by the Coalition of Cancer Cooperative Groups Scientific Leadership Council: systemic therapy and therapeutic individualization. Breast Cancer Res Treat 119(3):511-27, 2010.
24. Korde LA, **Gralow JR**. [Are bisphosphonates ready for the adjuvant setting?](#) Oncology 24(6):480, 485, 2010
25. Jensen MP, Chang HY, Lai YH, Syrjala KL, Fann JR, **Gralow JR**. [Pain in Long-Term Breast Cancer Survivors: Frequency, Severity, and Impact.](#) Pain Med. 2010 Jun 8. [Epub ahead of print]
26. Coleman RE, Lipton A, Roodman GD, Guise TA, Boyce BF, Brufsky AM, Clézardin P, Croucher PI, **Gralow JR**, Hadji P, Holen I, Mundy GR, Smith MR, Suva LJ. [Metastasis and bone loss: Advancing treatment and prevention.](#) Cancer Treat Rev. 2010 May 15. [Epub ahead of print]
27. Specht JM, Kurland BF, Montgomery SK, Dunnwald LK, Doot RK, **Gralow JR**, Ellis GK, Linden HM, Livingston RB, Allison KH, Schubert EK, Mankoff DA. [Tumor metabolism and blood flow as assessed by positron emission tomography varies by tumor subtype in locally advanced breast cancer.](#) Clin Cancer Res 16(10):2803-10, 2010.
28. Partridge AH, Archer L, Kornblith AB, **Gralow J**, Grenier D, Perez E, Wolff AC, Wang X, Kastrissios H, Berry D, Hudis C, Winer E, Muss H. [Adherence and persistence with oral adjuvant chemotherapy in older women with early-stage breast cancer in CALGB 49907: adherence companion study 60104.](#) J Clin Oncol 28(14):2418-22, 2010.
29. Korde LA, Zujewski JA, Kamin L, Giordano S, Domchek S, Anderson WF, Bartlett JM, Gelmon K, Nahleh Z, Bergh J, Cutuli B, Pruneri G, McCaskill-Stevens W, **Gralow J**, Hortobagyi G, Cardoso F. [Multidisciplinary meeting on male breast cancer: summary and research recommendations.](#) J Clin Oncol 28(12):2114-22, 2010.
30. Pippin J, Elias AD, Neubauer M, Stokoe C, Vaughn LG, Wang Y, Orlando M, Shonukan O, Muscato J, O'Shaughnessy JA, **Gralow J**. [A phase II trial of pemetrexed and gemcitabine in patients with metastatic breast cancer who have received prior taxane therapy.](#) Clin Breast Cancer 10(2):148-53, 2010.
31. Doot RK, Muzi M, Peterson LM, Schubert EK, **Gralow JR**, Specht JM, Mankoff DA. [Kinetic analysis of 18F-fluoride PET images of breast cancer bone metastases.](#) J Nucl Med. 51(4):521-7, 2010.
32. Albain KS, Barlow WE, Shak S, Hortobagyi GN, Livingston RB, Yeh IT, Ravdin P, Bugarini R, Baehner FL, Davidson NE, Sledge GW, Winer EP, Hudis C, Ingle JN, Perez EA, Pritchard KI, Shepherd L, **Gralow JR**, Yoshizawa C, Allred DC, Osborne CK, Hayes DF; Breast Cancer Intergroup of North America. [Prognostic and predictive value of the 21-gene recurrence score assay in postmenopausal women with node-positive, oestrogen-receptor-positive breast cancer on chemotherapy: a retrospective analysis of a randomised trial.](#) Lancet Oncol. 11(1):55-65, 2010.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

BIOGRAPHICAL SKETCH

NAME	POSITION TITLE		
Nancy L. Keating	Associate Professor of Medicine and Health Care Policy		
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include</i>)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Virginia Tech, Blacksburg	BS	1989	Biochemistry
Univ. of Chicago Pritzker	MD	1993	Medicine
Harvard School of Public	MPH	1998	Clinical

Research and Professional Experience: *Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.*

Professional Experience

1993-1994 Intern in Medicine, Brigham and Women’s Hospital, Boston, Massachusetts

1994-1996 Resident in Medicine, Brigham and Women’s Hospital, Boston, Massachusetts

1996-1998 Research/Clinical Fellow, Harvard Faculty Development and Fellowship Program in General Internal Medicine, Brigham and Women’s Hospital and Department of Health Care Policy, Harvard Medical School

1996- Associate Physician, Brigham and Women’s Hospital

1998-2003 Instructor in Medicine, Harvard Medical School

1998-2003 Instructor in Health Care Policy, Harvard Medical School

2003-2007 Assistant Professor of Medicine, Harvard Medical School

2003-2007 Assistant Professor of Health Care Policy, Harvard Medical School

2007- Associate Professor of Medicine, Harvard Medical School

2007- Associate Professor of Health Care Policy, Harvard Medical School

Honors:

1988 *Phi Beta Kappa*, Virginia Tech

1989 *B.S. Summa cum laude*, Virginia Tech

1991 International Society for Cardiovascular Surgery Research Award

1992 *Alpha Omega Alpha*, University of Chicago

1993 Joseph A. Capps Award for Outstanding Proficiency in Clinical Medicine, Univ. Chicago

1997 Mack Lipkin Sr. Associates Award, Society of General Internal Medicine

1999 Doris Duke Charitable Foundation Clinical Scientist Award

2000 Milton Hamolsky Junior Faculty Award, Society of General Internal Medicine

2003-2004 Program Chair, Society of General Internal Medicine Annual Meeting

2004-2005 Harvard Medical School Faculty Council

2004-2006 National Quality Forum Breast Cancer Technical Panel

2004- Member, Editorial Board, *Harvard Health Letter*

2005 Outstanding Junior Investigator of the Year, Society of General Internal Medicine

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2007-2010 Member, Editorial Board, *Journal of Clinical Oncology*

2007- Member, American Cancer Society Health Services Research and Health Policy Review Committee

2008- National Comprehensive Cancer Network Senior Adult Oncology Guideline Panel

2009- Council Member, Society of General Internal Medicine

Research Support:

18866 Abt Associates (McNeil) 11/20/06-04/30/10
Study of Cancer Care in the VA Role: Co-PI

The specific goals of the program evaluation are to assess the quality and costs of VA cancer care and to identify ways in which it might improve care for patients with one of five cancer sites within the VA.

1 U01 CA93324 (Ayanian) 09/01/01-08/31/09
National Cancer Institute (NCI) Role: Co-investigator
Cancer Care Outcomes Research & Surveillance Consortium (CanCORS)

The objectives of the CanCORS initiative are to: 1) enhance monitoring and understanding of the processes of cancer care and patient-centered factors influencing prognosis in population-based cohorts of lung and colorectal cancer patients; 2) establish a system for examining the relationship of the processes of care to clinical and patient-centered outcomes, with emphasis on measuring the dissemination of state-of-the science interventions and their association with better quality outcomes in the general population of cancer patients; and 3) examine disparities in the receipt of state-of-the-science cancer care and factors that contribute to disparities in outcomes and identify ways to lessen those disparities.

(Keating) 01/01/08-4/30/10
Dana Farber Cancer Institute Subcontract u/d Susan G. Komen Fd. Role: PI
Susan G. Komen Foundation

Disparities in Breast Cancer Care: The Influence of Physicians and Hospitals
Prior research has documented racial disparities in patterns of care and outcomes for women with breast cancer. However, the reasons for these disparities are not well understood. We will conduct a multi-phase study to understand whether the hospitals and physicians from whom black and white breast cancer patients get their care contribute to racial disparities in treatments and outcomes, and we will assess how patients select the providers from whom they receive care. Specifically, we will use administrative data and surveys of patients and physicians to assess (1) whether there are differences in the types of providers (physicians and hospitals) from whom black patients vs. white patients receive care and (2) how black and white breast cancer patients select the hospitals and providers from which they get their breast cancer care.

(Keating) 07/01/08-06/30/11
Prostate Cancer Foundation Role: PI
Prevention of Treatment and Disease-Related Morbidity During Androgen Deprivation Therapy:

A Multicenter Proposal
This project will examine a cohort of men of all ages diagnosed and treated for prostate cancer in the Veterans Affairs Health System to assess whether androgen deprivation therapy (via orchiectomy, GnRH agonist, or oral antiandrogen) is associated with an increased incidence of diabetes, coronary heart disease, myocardial infarction, sudden cardiac death, stroke, and fracture. We will also identify men at highest risk of complications from androgen deprivation therapy using data from the VA as well as a population-based cohort of older men living in SEER areas. This study will allow us to validate our previous findings of increased risk of fractures, diabetes, and cardiovascular disease in a new

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

cohort of men for whom we have richer clinical data. In addition, understanding who is at highest risk of complications could lead to interventions of screening, risk modification, or medication for these populations of men when they require GnRH agonist therapy.

R01 CA127652 (Keating)
05/01/08-10/30/10
National Cancer Institute (NCI)

Role: PI

Fractures, Heart Disease, and Stroke on Aromatase Inhibitors

Guidelines currently recommend that all postmenopausal woman with estrogen receptor-positive breast cancers and no contraindications be treated with an aromatase inhibitor at some point in the adjuvant course. Nevertheless, these drugs may have adverse effects. Clinical trials have identified increases in fracture rates, and some studies suggest a possible increase in the risk of cardiovascular disease. We will explore whether the use of aromatase inhibitors in community-based populations of early-stage breast cancer patients aged ≥ 51 is associated with an increased incidence of cardiovascular events and fracture. In addition, we will examine whether women treated with aromatase inhibitors are receiving recommended bone density testing. Comparison groups will include women with breast cancer treated with tamoxifen only, tamoxifen followed by aromatase inhibitors, no hormonal therapy, and closely-matched women with no history of breast cancer.

Publications (recent & most relevant):

- Keating NL, Zaslavsky AM, Ayanian JZ.** Physicians' experiences and beliefs regarding informal consultation. *JAMA* 1998; 280: 900-904.
- Keating NL, Cleary PD, Rossi AS, Zaslavsky AM, Ayanian JZ.** Use of hormone replacement therapy by postmenopausal women in the United States. *Ann Intern Med* 1999; 130: 545-53.
- Keating NL, Zaslavsky AM, Ayanian JZ.** Physicians' reports of expertise in clinical practice. *J Gen Intern Med* 2000; 15: 417-420.
- Keating NL, Weeks JC, Landrum MB, Borbas C, Guadagnoli E.** Discussion of treatment options for early-stage breast cancer: effect of provider specialty on type of surgery and satisfaction. *Med Care* 2001; 39:681-691.
- Keating NL, Green D, Kao A, Gazmararian JA, Wu V, Cleary PD.** How are patients' specific ambulatory care experiences related to trust, satisfaction, and considering changing physicians? *J Gen Intern Med* 2002; 17:29-39.
- Keating NL, Guadagnoli E, Landrum MB, Borbas C, Weeks JC.** Treatment decision making in early-stage breast cancer: should surgeons match patients' desired level of involvement? *J Clin Oncol* 2002; 20:1473-1479.
- Polsky D, Keating NL, Weeks JC, Schulman KA.** The utility of choice: options for breast cancer treatment. *Med Care* 2002; 40:1068-1079.
- Keating NL, Weeks JC, Borbas C, Guadagnoli E.** Treatment of early stage breast cancer: do surgeons and patients agree regarding whether treatment alternatives were discussed? *Breast Cancer Res Treat* 2003; 79: 224-231.
- Keating NL, Landrum MB, Ayanian JZ, Winer EP, Guadagnoli E.** Consultation with a medical oncologist before surgery and type of surgery among elderly women with early-stage breast cancer. *J Clin Oncol.* 2003; 21:4532-4539.
- Keating NL, Landrum MB, Landon BE, Ayanian JZ, Borbas C, Guadagnoli E.** Measuring the quality of diabetes care—comparison of administrative data and medical record data. *Health Services Res* 2003; 38: 1529-1545.
- Keating NL, Landon BE, Ayanian JZ, Borbas C, Guadagnoli E.** Practice, clinical management, and financial arrangements of practicing generalists: are they associated with satisfaction? *J Gen Intern Med* 2004; 19: 410-418.
- Keating NL, Gandhi TK, Orav EJ, Bates DW, Ayanian JZ.** Patient characteristics and experiences associated with trust in specialist physicians. *Arch Intern Med* 2004; 164: 1015-1020.
- Keating NL, Landrum MB, Landon BE, Ayanian JZ, Borbas C, Guadagnoli E.** The influence of physicians' practice management strategies and financial arrangements on quality of care among patients with diabetes. *Med Care*

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

2004;42:829-839

Keating NL, Landrum MB, Ayanian JZ, Winer EP, Guadagnoli E. The association of ambulatory care with breast cancer stage at diagnosis among Medicare beneficiaries. *J Gen Intern Med*. 2005; 20:38-44.

Keating NL, Landrum MB, Meara E, Ganz PA, Guadagnoli E. Do increases in managed care market share influence quality of care in the fee-for-service sector? *J Natl Cancer Inst*. 2005; 97: 257-64.

Keating NL, Nørredam M, Landrum MB, Huskamp HA, Meara E. Physical and mental health status of older long-term cancer survivors. *J Am Geriatr Soc* 2005; 53: 2145-2152.

Keating NL, Landrum MB, Guadagnoli E, Winer EP, Ayanian JZ. Factors related to underuse of surveillance mammography among breast cancer survivors. *J Clin Oncol* 2006; 24: 85-94.

Keating NL, Landrum MB, Meara E, Ganz PA, Guadagnoli E. Managed care market share and primary treatment for cancer. *Health Serv Res*, 2006; 41: 9-22.

Keating NL, Herrinton LJ, Zaslavsky AM, Liu L, Ayanian JZ. Variations in hospice use among cancer patients. *J Natl Cancer Inst* 2006; 98:1053-1059.

Keating NL, O'Malley AJ, Smith MR. Diabetes and cardiovascular disease during androgen deprivation therapy for prostate cancer. *J Clin Oncol*. 2006; 24:4448-4456.

Keating NL, Landrum MB, Guadagnoli E, Winer EP, Ayanian JZ. Surveillance testing among survivors of early-stage breast cancer. *J Clin Oncol*. 2007; 25: 1074-1081.

Keating NL, Landrum MB, Landon BE, Ayanian JZ, Borbas C, Guadagnoli E. The influence of cost containment strategies and physicians' financial arrangements on patients' trust and satisfaction. *J Ambul Care Manage* 2007; 30: 92-104.

Keating NL, Ayanian JZ, Cleary PD, Marsden PV. Factors affecting influential discussions among physicians: a social network analysis of a primary care practice. *J Gen Intern Med* 2007; 22: 794-798.

Rosenthal MB, Landrum MB, Huskamp HA, Meara E, Conti RM, **Keating NL**. Using performance data to identify preferred hospitals. *Health Serv Res* 2007. 42: 2109-2119.

Keating NL, Zaslavsky AM, Herrinton LJ, Selby JV, Wolf RE, Ayanian JZ. Quality of diabetes care among cancer survivors. *Med Care* 2007; 45: 869-875.

Stevenson DG, Huskamp HA, Grabowski, DG, **Keating NL**. Differences in hospice care between home and institutional settings. *J Palliat Med* 2007;10: 1040-7.

Keating NL, Landrum MB, Guadagnoli E, Winer EP, Ayanian JZ. Care in the months before death and hospice enrollment among women with advanced breast cancer. *J Gen Intern Med* 2008; 23: 11-18.

Landrum MB, Meara E, Chandra A, Guadagnoli E, **Keating NL**. Is spending more always wasteful? The appropriateness of care and outcomes among colorectal cancer patients. *Health Aff* 2008; 27: 159-168.

Keating NL, O'Malley AJ, McNaughton Collins M, Oh WK, Smith MR. Use of androgen deprivation therapy for metastatic prostate cancer in older men. *BJU Int* 2008; 101: 1077-1083.

Huskamp HA, Newhouse JP, Norcini JC, **Keating NL**. Per diem payment and variation in patient-level hospice costs. *Inquiry* 2008; 45: 232-244.

Hu JC, Wang Q, Pashos CL, Lipsitz S, **Keating NL**. Utilization and outcomes of laparoscopic radical prostatectomy. *J Clin Oncol* 2008; 26: 2278-2284.

Keating NL, Landrum MB, Klabunde CN, Fletcher RH, Rogers SO, Doucette WR, Tisnado D, Clauser S, Kahn KL. Adjuvant chemotherapy for stage III colon cancer: do physicians agree about the importance of patient age and comorbidity? *J Clin Oncol* 2008; 26: 2532-2537.

Keating NL, Stoeckert KA, Regan MM, DiGianni L, Garber JE. Physicians' reports about BRCA1/2 testing in community settings. *J Clin Oncol* 2008; 26: 5789-5796.

Freedman RA, He Y, Winer EP, **Keating NL**. Trends in racial and age disparities in definitive local therapy of early-stage breast cancer. *J Clin Oncol* 2009; 27: 713-719.

Huskamp HA, **Keating NL**, Malin JL, Zaslavsky AM, Weeks JC, Earle CC, Teno JN, Virnig BA, Kahn KL, He Y, Ayanian JZ.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Discussions with physicians about hospice among patients with metastatic lung cancer. Arch Intern Med 2009; 169; 954-962. PMID: PMC2291284

Hassett M, O'Malley OJ, **Keating NL**. Factors influencing changes in employment among women with newly diagnosed breast cancer. Cancer 2009; 115:2775-82. PMID: PMC2720601

Keating NL, Kouri E, He Y, Weeks JC, Winer EP. Racial differences in definitive breast cancer surgery: are they explained by the hospitals where patients undergo surgery? Med Care 2009; 47:765-73.

Hu JC, Gu X, Lipsitz SR, Barry MJ, D'Amico A, Fowler FJ, Weinberg AC, **Keating NL**. Comparative effectiveness of minimally invasive versus open radical prostatectomy. JAMA 2009; 302:1557-1564.

Keating NL, O'Malley AJ, Freedland SJ, Smith MR. Diabetes and cardiovascular disease during androgen deprivation therapy: observational study of veterans with prostate cancer. J Natl Cancer Inst 2010. 102: 39-46.

Keating NL, Landrum MB, Rogers SO, Baum SK, Virnig BA, Huskamp HA, Earle CC, Kahn KL. Physician factors associated with discussions about end-of-life care. Cancer 2010. 116: 998-1006.

Earle CC, Chretien Y, Morris C, Ayanian JZ, **Keating NL**, Polgreen LA, Wallace R, Ganz PA, Weeks JC. Employment and insurance coverage among survivors of lung cancer and colorectal cancer. J Clin Oncol 2010; 28:1700-1705.

Fang F, **Keating NL**, Mucci L, Adami H-O, Stampfer M, Valdimarsdóttir U, Fall K. Immediate risk of suicide and cardiovascular death following a prostate cancer diagnosis in the Surveillance, Epidemiology, and End Results Program. J Natl Cancer Inst 2010. 102: 307-314.

Keating NL, Landrum MB, Lamont EB, Earle CC, McNeil BJ. Aggressiveness of end-of-life care for older cancer patients in the VA versus the private sector. Cancer 2010. In press.

Kouri EM, He Y, Winer EP, **Keating NL**. Influence of birthplace on breast cancer diagnosis and treatment for Hispanic women. Breast Cancer Res Treat 2010. 121:743-751.

Huskamp HA, Stevenson DG, Grabowski DC, Brennan E, **Keating NL**. Long and short hospice stays among nursing home residents at the end of life. J Palliat Med 2010. In press.

Keating NL, Landrum MB, Brooks JM, Chrischilles EA, Winer EP, Wright K, Volya R. Outcomes following surgery for early-stage breast cancer in non-trial populations. Br Can Res Treat 2010. In press.

Freedman RA, Virgo KS, He Y, Pavluck AL, Winer EP, Ward EM, **Keating NL**. The association of race/ethnicity, insurance status, and socioeconomic factors with breast cancer care. Cancer 2010. In press.

Wright AA, **Keating NL**, Balboni TA, Matulonis UA, Block SD, Prigerson HG. Place of death: associations with patients' quality of life and bereaved caregivers' mental health. J Clin Oncol 2010. In press.

Smith Nielsen S, He Y, Ayanian JZ, Lin Gomez S, Kahn KL, West DW, **Keating NL**. Quality of cancer care among foreign-born and US-born patients with lung or colorectal cancer. Cancer 2010. In press.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3.9: BIOGRAPHICAL SKETCH

Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

<i>Name:</i> Nigendo, Gustavo	<i>Position/Title:</i> Director Innovation of Health System and Services Research		
<i>Education/Training</i>			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
National Autonomous University of Mexico. National School of Anthropology and History.	B.S.	06/85	Biology
London School of Hygiene and Tropical Medicine	M.S. M.S.	06/91 10/90	Social Anthropology Health Planning and Financing
London School of Economics and Political Science	PhD	06/95	Social Science and Administration

Research and Professional Experience: *Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.*

Employment:

1985-1991 Researcher A. National Institute of Public Health

1995-2000 Researcher. C National Institute of Public Health

2001-2005 Director of Center of Social and Economic Analysis. Mexican Health Foundation

2005- Director, Innovations of Health System and Services Research

2005- Coordinator of the Doctoral Program (PhD) on Health Systems Research, National Institute of Public Health. Mexico

2008- Adjunct Coordinator of the Doctoral Program (DrPH) on Public Health, National Institute of Public Health. Mexico

Government, Public Advisory Committee or other similar Service:

2002- Associate Researcher. Institute of Development Studies. Sussex

2004- Editorial Board. Human Resources for Health. BioMed Central

2005- Editorial Board. Salud Pública de Mexico

2007- Coordinator, Human Resources for Health Research Group in Latin America

Ongoing Research Support

15/09/07-12/12/11

National Institute of Public Health

Evaluation of the Social Protection Health in System

General Purpose: Assess the effects of the current models for management of the Protection Fund Against

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Catastrophic Expenditure and the transfer of resources from the State System of Social Protection in health to the units as well, as the productivity of health human resources

Role: Coordinator

20/08/10-12/12/10

National Institute of Public Health

Provide services for early detection and treatment of breast cancer in the states of Jalisco, Morelos and Nuevo León

General Purpose: Analyze the responsiveness of health systems Jalisco, Morelos and Nuevo Leon, on the care of patients with breast cancer, and the result of training for early detection and provide recommendations on the basis of the results

Role: Co-Researcher

01/07/10-18/12/10

National Institute of Public Health

Advances and challenges in implementing public policies for breast cancer care in Latin America

General Purpose: Develop a breast cancer scorecard for Argentina, Brazil, Colombia and Mexico. The scorecard will present breast cancer-related data and compare each country's policy progress in this area. The project will gather experts to make policy recommendations related to breast cancer and develop an advocacy agenda for each of the countries mentioned.

Role: Coordinator

Program Director/Principal Investigator (Last, First, Middle): Hunt, Virginia, L.

PHS 398/2590 (Rev. 06/09) Page 7 **Continuation Format Page**

15/05/08-15/02/09

National Institute of Public Health

Research on social barriers to early diagnosis in breast cancer

General Purpose: Analyze the factors related to the prevention, diagnosis, treatment and management of female breast cancer from the perspective of Mexican women aged 25 and over, their partners and staff in charge of health care units to meet the social barriers cultural, geographic, economic, behavioral, family and organizational impact on seeking care of this condition.

Develop policy recommendations for decision makers in the health system to guide the development of programs that lead to easier access to early diagnosis of breast cancer

Role: Coordinator

Publications:

1. Knaul FM, Nigenda G, Lozano R, Arreola-Ornelas H, Langer A, Frenk J. Breast cancer in Mexico: a pressing priority. *Reproductive Health Matters*, Nov., 113-123. 2008.
2. Ruiz-Rodríguez M, Wirtz VJ, Nigenda G. Organizational elements of health service related to a reduction in maternal mortality: the cases of Chile and Colombia. *Health Policy*. Nov 6, 2008.
3. Nigenda G, Ruiz JA, Bejarano R. Educational and labour wastage of doctors in Mexico. Towards the construction of a common methodology. *Journal of Human Resources for Health*. BioMedCentral. WHO. 2005.

Additional recent publications of importance to the field (in chronological order)

1. Nigenda G, González LM. Contracting private sector providers for public sector health services in Jalisco, Mexico: perspectives of system actors. *Human Resources for Health* 2009, 7:79
2. Knaul FM, Nigenda G, Lozano R, Arreola-Ornelas H, Langer A, Frenk J. Breast cancer in Mexico: a pressing priority. *Reproductive Health Matters*, Nov., 113-123. 2008.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3. Nigenda G, González LM, Caballero M, Zarco A, González MC. Barriers to access to care of breast cancer in four states in Mexico. 2009. Executive Summary. Mexico. National Public Health Institute ISBN: 978-670-7530-64-0
4. González-Block MA, Nigenda G et. al. Evaluation of the Social Protection System in Health, 2007. Executive Summary. Mexico. National Public Health Institute. ISBN: 978-970-721-497-2
5. González-Block MA, Nigenda G et. al. System of Social Protection in Health. Assessment of administrative processes. Mexico. National Public Health Institute. ISBN: 978-607-7530-06-0

3.9: BIOGRAPHICAL SKETCH

Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

Name: Rocío Saenz Madrigal		Position/Title: Researcher and teacher in public health topics	
<i>Education/Training</i> Medical Doctor and MPH. Public Health			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
Universidad de Costa Rica	Public Health School,	1990	Health system evaluation Ethics and public health
Universidad Nacional	Coordinator of health public de policies	(2006-2010)	Health Promotion Health Observatory Social process for Breast Cancer in Costa Rica

Research and Professional Experience: Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.

Employment:

2006-2010 **Universidad Nacional en Costa Rica, Work and health Program for CentralAmerica SALTRA** (www.saltra.info), Coordinator of policy program

2008-2010 **Heath Observatory for LAC and the Caribbean, Joint project** with Fundación Mexicana Para la Salud y el Instituto CARSO para la salud Regional and national advisor on health metrics

2009 **Panamerican Health Organization (PAHO/UWHO), Preparedness of Emergency and Aid for Desasters (PED)**
General Coordinator for “Material de Capacitación y Abogacía dirigido a Autoridades de Salud y Gerentes de Programas de Desastres de América Latina”

Mayo – Agosto **Bill & Melinda Gates Foundation**

2008 Consultant for the Global health program on Latin America, with spetial focus in

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Guatemala and Nicaragua

2004 – 2006 Consejo Social del Gobierno de Costa Rica Ministra Coordinadora

2002-2006 Gobierno de Costa Rica Ministra de Salud

Research Support:

Coordinator of “Desarrollo de Capacidades políticas, sociales y económicas en Jóvenes de tres áreas urbano-marginales de Heredia, Costa Rica”. Financiado por Consejo Nacional de Rectores, Costa Rica

Coordinator del “Proyecto de Fortalecimiento de Equipos de respuesta a brotes epidémicos de malaria, dengue y leptospirosis”. Financiado por Organización Panamericana de la Salud.

Research member of Los Santos Project: Building a health care coverage for tempotal pickcoffe workers, Costa Rica. Financiado por Fondos Universidad Nacional.

Advisor two doctoral thesis: Management and public policy: Health Sector, Universidad de Costa Rica and Universidad Complutense de Madrid. 2010

Support the Observatory of Health in Costa Rica and Central America

Costa Rica Health System Map

Breast Cancer building a social proces

Publications (recent & most relevant):

- a. Sáenz, Rocío. Bermúdez, Juan L. Ortiz, Adolfo. Gutiérrez, Marcela, (2010 en publicación) Proceso social del cáncer de mama en Costa Rica Vol. I: Perspectiva epidemiológica. San José, Costa Rica.
- b. Sáenz, R. Bermúdez, JL. (2010 en publicación). Funciones Esenciales de la Salud Pública y Desastres. La Salud Pública en Costa Rica, Estado Actual, Retos y Perspectivas. Escuela de Salud Pública. Universidad de Costa Rica, San José.
- c. Sáenz, R. Bermúdez, JL Acosta, M. (2010 en publicación). Universal Coverage In Costa Rica: Lessons And Challenges From A Middle Income Country. Fundación Mexicana para la Salud. Artículo para el World Health Report 2010, de la World Health Organization WHO, Genève.
- d. Saenz, R. Outbreak of malaria and natural disaster. Atlantic Coast. June 1989-May 1992
- e. Saenz, R.; Bissell, R.; Paniagua, F.; Malaria following a disaster in Costa Rica. Prehospital and Disaster Medicine, Vol. 10; N. 3; July-September 1995.
- f. Saenz, R.; Ethics governmental Role. Journal Ethos IV 2007-2008

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3.9: BIOGRAPHICAL SKETCH
Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

Name: Magdalena Rathe		Position/Title: Executive Director of Fundacion Plenitud	
Education/Training			
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>
Universidad Autónoma de Santo Domingo (UASD)	Economist – Magna Cum Laude Post-graduate	1979	Economic Development

Research and Professional Experience: Concluding with present position, list in chronological order previous employment, experience and honors. Include present membership on any Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past five years and earlier publications pertinent to the application.

Employment:

Founder President and Executive Director of Fundacion Plenitud, from 2002 to date, a think-tank based in the Dominican Republic to produce and disseminate knowledge and generate evidence to sustain policies promoting equity and sustainable development.

Consultant in health economics, 2001 – date. International consultant in health economics. Some recent appointments include the HLSP, MSH, World Bank, USAID, Harvard School of Public Health and others.

Associate researcher, the Center for International Health of the George Washington University, at the Center for International Health of the George Washington University, working as the Manager for Monitoring and Evaluation of FONAP (a primary health care financing fund) in the Dominican Republic, 1999 – 2001.

Independent consultant in health economics, 1997 – 1999.

Honors:

Graduated Magna Cum Laude from University.
Excellence Diploma from a Business College previous to University.

Government, Public Advisory Committee or other similar Service:

Member of the Monetary Board of the Dominican Republic (Board of Directors of the Central Bank of the DR-honorary position, 2000-2003, one of two first women appointed to this position).

Member of several non-for profit institutions devoted to service – education, promotion of human values, fighting poverty.

Research Support:

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Dominican Republic, 2010, Principal Researcher on a large study with several components on the performance of the Dominican health system, applying several health metrics to maternal health and breast cancer, Plenitud/LAC-HO/IDB.

Dominican Republic, 2009, Principal Researcher for the study on health financial protection for the Dominican Republic, as part of a LAC regional study conducted by the LAC Health Observatory. This includes a paper on household catastrophic expenditure and another on the health system performance.

LAC, 2009, Coordinator of a study on the state of the art of national health accounts in nine LAC countries, LAC Health Observatory

Dominican Republic, 2009, Principal Researcher for the study on National AIDS Expenditures Assessment (NASA) for UNAIDS.

Dominican Republic, 2009, Consultant to estimate the long term financing of AIDS in the DR, Bitrán y Asoc. and UNAIDS.

Dominican Republic, 2009, Consultant to assess the impact of the world economic crisis on HIV-AIDS, UNAIDS.

LAC, 2008. Technical assistance to COPRECOS-LAC in the preparation of the financial proposal to the Global Fund to finance regional activities, ALEPH / UNAIDS, 2008.

Dominican Republic, 2008, Coordinator for the preparation of the M&E report on HIV-AIDS, UNGASS 2008, for UNAIDS, DR, 2008.

Dominican Republic, 2008, preparation of a chapter on the pharmaceutical expenditures in the DR, to be included in a study being elaborated by the Human Development Office of the UNDP/DR.

Dominican Republic, 2007-2009, Director of the study on the impact of the new international standards on intellectual property rights on medicines' prices in the Dominican Republic (application of an econometric model developed by ICTSD, WHO and the World Bank Institute), present.

Dominican Republic, 2007. Technical assistance to COPRESIDA on the budget preparation process for the Global Fund 7th Round DR's proposal, UNAIDS, 2007.

Dominican Republic, 2007. Costing of interventions included in the HIV-AIDS National Strategic Plan 2007-2015, and preparation of budget for years 2007-2007, COPRESIDA – Global Fund, Santo Domingo, 2007.

Dominican Republic, 2006. Programme Acceleration Funds Review and Impact Assessment, 2002-2005: Dominican Republic Case Study, Consultancy report presented to HLSP/UNAIDS, Regional Consultant, Santo Domingo, 2006.

Suriname, 2006. Team leader in a project by Management Sciences for Health (MSH) / PLENITUD to provide technical assistance to develop national capacity to analyze national health expenditures in Suriname, with Inter-American Development Bank financing.

Nigeria, 2005-2006. Support to the Ekiti State Ministry of Health, Nigeria, for the development of the State Health

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Accounts, HLSP, United Kingdom under PATHS project financed by DFDI, Nigeria, 2005 to present. This includes technical assistance for the implementation of a health expenditures household survey and subsequent analysis with equity perspective.

Nigeria, 2005. Scoping mission on household expenditure survey to feed into the state health accounts in Ekiti State (PATHS project).

Trinidad & Tobago, 2005. Framework for Monitoring and Evaluating National HIV-AIDS Programmes in the Caribbean Region, for the Caribbean Health Research Council (CHRC).

Trinidad & Tobago, 2004. Assessment of the National HIV-AIDS program of the Dominican Republic, for the Caribbean Research Health Council (CRHC).

Dominican Republic, 2004. Research director for studies on economics of HIV-AIDS: socioeconomic impact of HIV-AIDS in the Dominican Republic, HIV-AIDS national accounts and M&E Plan for the World Bank financed project for HIV-AIDS, COPRESIDA.

Dominican Republic, 2004. Team leader for the institutional strengthening of the Dominican Health Ministry for the creation of a unit for the production of National Health Accounts on a regular basis. Project financed by IDB.

Nicaragua, 2001-2005. Technical assistance for the institutionalization of a National Health Accounts Unit in the Ministry of Health, as a consultant of Harvard School of Public Health.

Nicaragua, 2005. Development of a methodological proposal to prepare National Education Accounts, for Harvard School of Public Health and Management Sciences for Health (MSH), to be applied in Nicaragua and El Salvador.

Nicaragua, 2003. Trainer on "Guide to producing NHA: Focus in low and middle income countries". Methodological workshop held in Nicaragua by PHRplus, from July 28th to August 3rd, 2003.

Nicaragua, 2003. Consultant for USAID Nicaragua to prepare an in-depth analysis of the health expenditure module included in the DHS survey: "Nicaragua: Health and Equity".

Dominican Republic, 2003. Consultant for UNDP for a study on socio economic impact of HIV AIDS in the tourism sector in the Dominican Republic.

2002 – 2003. Editor of the web page on national health accounts sponsored by the World Bank, IDB, PAHO and USAID.

PAHO/Latin America, 2002. Consultant for the Pan-American Health Organization (PAHO) and the World Bank, for the preparation of a proposal to estimate national expenses in the essential public health functions in Latin America.

Paraguay, 2002. Consultant for the World Bank for the preparation of a health expenditure review for Paraguay including an evaluation of their national health accounts.

Dominican Republic, 2001. Author of the study "Per capita value of the health care package for the new social security system of the Dominican Republic", CERSS, D.R.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Dominican Republic, 2000. Author of the study “Determination of the Cost of a Primary Care Health Package in the Dominican Republic”, for the International Center of Health of the George Washington University.

Dominican Republic, 1999. Consultant for Macro International, Washington, DC, for the analysis of the health expense module included in the DHS Survey of 1996 in the Dominican Republic.

Publications (recent & most relevant):

Books edited or written

M. Rathe, Ramón Pérez Minaya, Lesly Franco and Dania Guzmán, **Medicines and Intellectual Property**, Plenitud Working Paper Series / ICTSD / SESPAS / PAHO / PNUD, Santo Domingo, DR, 2009.

M. Rathe, **Health Reform and Social Security**, Pontificia Universidad Católica Madre y Maestra (PUCMM) and Cenantillas, Santo Domingo, 2002, (80 p.).

M. Rathe, **Health and Equity: A Look to Health Care Financing in the Dominican Republic**, Macro International and USAID / Santo Domingo, 2000, (166 p.)

Health: Vision of Future – Elements for a National Agreement, Santo Domingo, R.D., OCT/CNS, 1996, (104 p.). (I was the editor and wrote most of the text).

M. Rathe, **Microfinance Supply Profile in the Dominican Republic**, UNICEF, Santo Domingo, 1995, (56 p.). (Final consultancy report published by UNICEF).

M. Rathe, I. Santana, **Distributive Impact of Fiscal Policy**, Fundación Siglo 21 Editors, Santo Domingo, 1992, (268 p.).

M. Rathe, I. Santana, **Social Reform: An Agenda Against Poverty**, Fundación Siglo 21 Editors, Santo Domingo, 1992, (277 p.).

M. Rathe, **Fiscal Reform: Policy and Administration**, Instituto de Capacitación Tributaria (INCAT), (Tax Training Institute), Santo Domingo, (1981). (I was editor of the book and author of a chapter on Foreign Trade Taxation).

Papers in refereed journals:

G. LaForgia, M.Rathe, R.Levine, A.Díaz. **Fend for Yourself: Systemic Failure in the Dominican Health Care Market and Prospects for Change**. Social Science and Medicine Journal, 26 p. This paper was presented at the World Conference of the International Health Economics Association (IHEA), Rotterdam, The Netherlands, 1999.

International non-refereed journals:

M. Rathe, **The Financing of the Dominican Health System**, International Clearing House of Health System Reform Initiative, Newsletter No. 5, July – September 2000. (15 p.). This paper was presented at the II World Symposium of National Health Accounts, Rotterdam, The Netherlands, 1999.

Chapters in books:

M.Rathe, A. Schwaiger, **Estimate of Expenditures and Financing for EPHF and Mechanisms for Determining Costs and Budgeting**, Chapter XIV in *Public Health in the Americas: Concept renewal, performance assessment and bases*

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

for action. Pan American Health Organization (PAHO), Washington, DC. (2002).

M. Rathe, I. Santana, **The Distributive Impact of Fiscal Policy in the Dominican Republic**, Chapter III in *Government Spending and Income Distribution in Latin America*, edited by R. Hausmann and R. Rigobon, from IESA, Venezuela. Published by the Inter-American Development Bank and distributed by The John Hopkins University Press, Washington, D.C., 1993, (34 p.).

M. Rathe, I. Santana, **Social Service Delivery System in the Dominican Republic: a reform agenda**, Chapter IV in *Social Service Delivery System: a reform agenda*, edited by Cristian Aedo and Osvaldo Larrañaga, from ILADES, Chile. Inter-American Development Bank press and Georgetown University press, Washington, D.C. 1994, (41 p.).

M. Rathe, **Health Care Reform: Some Ideas on How to Start**. Chapter of the book *Agenda Nacional de Desarrollo: Planes de Acción para las Diez Principales Prioridades*, (*National Development Agenda: Action Plans for Ten Priorities*), Grupo Acción por la Democracia, Pontificia Universidad Católica Madre y Maestra (PUCMM), Santo Domingo, 1996, (21 p.).

M. Rathe, **Health Care Financed by Social Security: Towards a New System**. Paper presented on VIII INSALUD National Forum, October 1996, and published in the book *La Reforma del Sistema de Salud y Seguridad Social, en el Marco de la Reforma del Estado*, (*Health and social security reform and state reform*), INSALUD, Santo Domingo, 1997, (10 p.).

M. Rathe, **Microfinance and Gender**, paper prepared as a part of the regional research project *Finance Services for Microenterprise Women*, edited by Gloria Almeyda, financed and published by Inter-American Development Bank, 1994, (26 p.).

Any other publication

Director and editor of **Tributación** (Taxes), a quarterly journal with international distribution, Ministry of Finance of the Dominican Republic, 1980-1982.

Director and editor of **Fiscal Reform**, a weekly newsletter published in Listín Diario, the most important newspaper in the Dominican Republic, 1981-1982 (sixty numbers were published).

M. Rathe, R. Pérez Minaya, E. Castillo, **To Build an Export Oriented Society: Guidelines for a Development Strategy**. Working paper prepared to create consensus around the issue, published by enterprise associations of the North Region, Santiago, Dominican Republic, 1993, (41 p.).

M. Rathe, **Equity and Development**, United Nations Development Program (UNDP) and General Direction for Women Promotion, 1994, (Final consultancy report).

M. Rathe, R. Pérez Minaya, **The Economic Evolution of the Dominican Republic: Three Decades**, paper prepared for a seminar in Dominican economy, Technological Institute of Santo Domingo, 1994, (32 p.).

International Presentations on Health Economics:

M. Rathe and R. Valladares, **State of the Arts of Health Accounts in LAC**, 6th World Symposium on National Health Accounts, Beijing, China, 2009.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

M. Rathe, **Using DHS and NHA indicators to Assess Equity in LAC**, International Health Economics Association, 6th World Congress, Copenhagen, Denmark, and 5th World Symposium on National Health Accounts, Lund, Sweden, July 2007.

M. Rathe, A. Moline, **Training Course on NHA**, Paramaribo, Suriname, 2006.

M. Rathe, **National Education Accounts**, Managua, Nicaragua, 2005.

M. Rathe, Pérez Láinez, Leonel, **Methodology for the estimation of time series of out-of-pocket health expenditures**, International Health Economics Association, 5th World Congress and 4th World Symposium on National Health Accounts, Barcelona, Spain, July 2005.

M. Rathe, **Public Health Financing: A key feature to make stewardship operational**, International Health Economics Association, 4th World Congress, San Francisco, USA, June 2003.

M. Rathe, **Nicaraguan NHA in an international context**, Managua, Nicaragua, December 2002.

M. Rathe, **National Health Accounts: Uses for Policy Making**, Managua, Nicaragua, August and December 2001, February 2002.

M. Rathe, **Achieving Equity Within the Context of Health Finance and Reform**, poster presentation at the International Health Economics Association (IHEA), York, England, July 2001.

M. Rathe, **The Regional Network Approach to NHA: A Perspective from Latin-America**, presentation at the World Symposium of National Health Accounts, York, England, July 2001.

X. SOLÓRZANO, M. RATHE, J. RUSSELL, REFLECTIONS ON HOW TO ORGANIZE A HEALTH SYSTEM TO ACHIEVE EQUITY, **CLAD, SANTO DOMINGO, (2000)**.

M. Rathe, **Using National Health Accounts to Assess Equity in the Dominican Republic**, presentation at the World Symposium of National Health Accounts, Rotterdam, The Netherlands, 1999.

M. Rathe, **National Health Accounts in the Dominican Republic: Analysis and Results**, Final Regional Seminar, PHR / PAHO / FUNSALUD / Harvard University / Abt. Juan Dolio, D.R., June 1998.

M. Rathe, **National Health Accounts: Data and Methodology**. Presentation for the NHA seminar held on Cuernavaca, Mexico. Partnerships for Health Care Reform, Mexican Foundation for Health (FUNSALUD), PAHO, Harvard University, Abt. April 1997.

M. Rathe, **National Health Accounts: Use for Equity Analysis**. Presentation for the NHS seminar held on Quito, Ecuador. Partnerships for Health Care Reform, Mexican Foundation for Health (FUNSALUD), PAHO, Harvard University, Abt. October 1997.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

3.9: BIOGRAPHICAL SKETCH																							
<i>Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.</i>																							
Name: Porter, Peggy M.D.		Position/Title: Member & Program Head, Fred Hutchinson Cancer Research Center																					
<i>Education/Training</i> Medical Doctor and MPH. Public Health																							
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>																				
California State University, Humboldt Arcata, CA	BA	06/1980	Botany																				
University of New Mexico, Albuquerque, NM	MD	07/1987	Medicine																				
<u>Post-Graduate Training</u>																							
University of Washington, Seattle, WA	Resident	07/87-06/91	Pathology																				
University of Washington, Seattle, WA	Res. Fellow	07/90-06/91	Pathology																				
<p>A. Personal Statement Peggy Porter, M.D. is a Full Member in the Divisions of Human Biology and Public Health Sciences at FHCRC, Head of the Program in Breast Cancer Research at FHCRC, and Full Professor of Pathology at UW. She is board certified in Anatomic Pathology and Cytology and is an internationally recognized breast cancer research pathologist.</p> <p>B. Positions and Honors <u>Professional Experience:</u></p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px 0;">Research Fellow, Clinical Oncology Award, American Cancer Society</td> <td style="text-align: right; padding: 2px 0;">1989-1990</td> </tr> <tr> <td style="padding: 2px 0;">Acting Instructor/Chief Resident, Dept. of Pathology, U. of Washington, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1991-1992</td> </tr> <tr> <td style="padding: 2px 0;">Acting Assistant Professor, Department of Pathology, U. of Washington, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1992-1993</td> </tr> <tr> <td style="padding: 2px 0;">Assistant Professor, Department of Pathology, University of Washington, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1993-1998</td> </tr> <tr> <td style="padding: 2px 0;">Associate Professor, Dept. of Pathology, U. of Washington, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1998-2005</td> </tr> <tr> <td style="padding: 2px 0;">Associate in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington</td> <td style="text-align: right; padding: 2px 0;">1993-1995</td> </tr> <tr> <td style="padding: 2px 0;">Assistant Member, Program in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington</td> <td style="text-align: right; padding: 2px 0;">1995-1998</td> </tr> <tr> <td style="padding: 2px 0;">Associate Program Head, Program in Breast Cancer Research, Fred Hutchinson Cancer Research Center, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1997-2000</td> </tr> <tr> <td style="padding: 2px 0;">Associate Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA</td> <td style="text-align: right; padding: 2px 0;">1998-2004</td> </tr> <tr> <td style="padding: 2px 0;">Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences,</td> <td style="text-align: right; padding: 2px 0;">2004-present</td> </tr> </table>				Research Fellow, Clinical Oncology Award, American Cancer Society	1989-1990	Acting Instructor/Chief Resident, Dept. of Pathology, U. of Washington, Seattle, WA	1991-1992	Acting Assistant Professor, Department of Pathology, U. of Washington, Seattle, WA	1992-1993	Assistant Professor, Department of Pathology, University of Washington, Seattle, WA	1993-1998	Associate Professor, Dept. of Pathology, U. of Washington, Seattle, WA	1998-2005	Associate in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington	1993-1995	Assistant Member, Program in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington	1995-1998	Associate Program Head, Program in Breast Cancer Research, Fred Hutchinson Cancer Research Center, Seattle, WA	1997-2000	Associate Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA	1998-2004	Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences,	2004-present
Research Fellow, Clinical Oncology Award, American Cancer Society	1989-1990																						
Acting Instructor/Chief Resident, Dept. of Pathology, U. of Washington, Seattle, WA	1991-1992																						
Acting Assistant Professor, Department of Pathology, U. of Washington, Seattle, WA	1992-1993																						
Assistant Professor, Department of Pathology, University of Washington, Seattle, WA	1993-1998																						
Associate Professor, Dept. of Pathology, U. of Washington, Seattle, WA	1998-2005																						
Associate in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington	1993-1995																						
Assistant Member, Program in Cancer Biology, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, Washington	1995-1998																						
Associate Program Head, Program in Breast Cancer Research, Fred Hutchinson Cancer Research Center, Seattle, WA	1997-2000																						
Associate Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA	1998-2004																						
Member, Program in Cancer Biology, Divisions of Human Biology & Public Health Sciences,	2004-present																						

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Fred Hutchinson Cancer Research Center, Seattle, WA	
Program Head, Breast Cancer Research Program, Fred Hutchinson Cancer Research Center, Seattle, WA	2000-2008
Director Specialized Pathology Shared Resource, present	2001-
Fred Hutchinson Cancer Research Center, Seattle, WA	
Professor, Dept. of Pathology, U. of Washington, Seattle, WA	2005-
present	
Program Co-Head, Women's Cancer Research Program, Fred Hutchinson Cancer Research Center, Seattle, WA	2008-
present	

Board Certification:

Added Qualification in Pathology: Cytopathology
1994

Diplomate, American Board of Pathology 1992

Diplomate, National Board of Medical Examiners
1987

Medical Licensure:

Licensed Physician and Surgeon, Washington State, License #28302

1989-

present

C. Selected Peer-reviewed Publications

Li CI, Malone KE, **Porter PL**, Weiss NS, Tang MT, Daling JR. The relationship between alcohol use and risk of breast cancer by histology and hormone receptor status among women 65-79 years of age. *Cancer Epidemiol Biomarkers Prev*, 12:1061-1066, 2003.

Li CI, Malone KE, **Porter PL**, Weiss NS, Tang MT, Daling JR. Reproductive and anthropometric factors in relation to the risk of lobular and ductal breast carcinoma among women 65-79 years of age. *Int J Cancer*, 107:647-651, 2003.

Li CI, Malone KE, **Porter PL**, Daling JR. Epidemiologic and molecular risk factors for contralateral breast cancer among young women. *Br J Cancer*, 89:513-518, 2003.

Foulkes WD, Brunet J-S, Stefansson IM, Straume O, Chappuis PO, Bégin LR, Hamel N, Goffin JR, Wong N, Trudel M, Kapusta L, **Porter PL**, Akslen LA. The prognostic implication of the basal-like (cyclin E high/p27low/p53+/glomeruloid-microvascular-proliferation+) phenotype of BRCA1-related breast cancer. *Cancer Research* 64:830-835, 2004.

Porter PL, Lund MJ, Lin MG, Yuan X, Liff JM, Flagg EW, Coates RJ, Eley JW. Racial differences in expression of cell cycle regulatory proteins in breast cancer. *Cancer* 100:2533-2542. 2004.

Buist DSM, **Porter PL**, Lehman C, Taplin SG, White JE. Factors contributing to mammography failure in women aged 40-49 years. *JNCI* 96(19):1432-40, 2004.

Loo LW, Grove DI, Williams EM, Neal CL, Cousens LA, Schubert EL, Holcomb IN, Massa HF, Glogovac J, Li CI, Malone KE, Daling JR, Delrow JJ, Trask BJ, Hsu L, **Porter PL**. Array CGH Analysis of Genomic Alterations in Breast Cancer Sub-Types. *Cancer Res*. 64:8541-8549, 2004.

Aiello EJ, Buist DSM, White E, **Porter PL**. The association between mammographic breast density and breast cancer tumor characteristics. *Ca Epidemiol Biomarkers Prev*. 14:662-668. 2005.

Hsu L, Self SG, Grove D, Randolph T, Wang K, Delrow JJ, Loo L, **Porter P**. Denoising array-based comparative genomic hybridization data using wavelets. *Biostatistics* (2):211-26, 2005.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

- Porter PL**, Barlow WE, Yeh I-T, Lin M-G, Yuan X, Donato E, Sledge GW, Shapiro CL, Ingle JN, Haskell CM, Albain KS, Roberts JM, Livingston RB, Hayes DF. p27Kip1 and Cyclin E Expression and Breast Cancer Survival After Treatment With Adjuvant Chemotherapy. *J. Natl. Cancer Inst.* 98(23):1723-1731, 2006.
- Abrahamson PE, Gammon MD, Lund MJ, Britton JA, Marshall SW, Flagg EW, **Porter PL**, Brinton LA, Eley JW, Coates RJ. Recreational physical activity and survival among young women with breast cancer. *Cancer* 107(8):1777-1785, 2006.
- Trivers KF, Gammon MD, Abrahamson PE, Lund MJ, Flagg EW, Kaufman JS, Moorman PG, Cai J, Olshan AF, **Porter PL**, Brinton LA, Eley JW, and Coates RJ. Association between reproductive factors and breast cancer survival in younger women. *Breast Cancer Res Treat*, 103: 93-102, 2007.
- Katz A, Saad ED, **Porter PL**, Pusztai L. Primary systemic chemotherapy of invasive lobular carcinoma of the breast. *Lancet Oncol* 8(1):55-62, 2007.
- Chin SF, Teschendorff AE, Marioni JC, Wang Y, Barbosa-Morais NL, Thorne NP, Costa JL, Pinder SE, van de Wiel MA, Green AR, Ellis IO, **Porter PL**, Tavare S, Brenton JD, Ylstra B, Caldas C. High-resolution aCGH and expression profiling identifies a novel genomic subtype of ER negative breast cancer. *Genome Biol*, 8:R215, 2007.
- Trivers KF, Gammon MD, Abrahamson PE, Lund MJ, Flagg EW, Moorman PG, Kaufman JS, Cai J, **Porter PL**, Brinton LA, Eley JW, Coates RJ. Oral contraceptives and survival in breast cancer patients aged 20 to 54 years. *Cancer Epidemiol Biomarkers Prev*, 16:1822-1827, 2007.
- Porter PL**. "Westernizing" Women's Risks? Breast Cancer in Lower-Income Countries. *NEJM*, 358:213-216, 2008.
- Li CI, Malone KE, **Porter PL**, Lawton TJ, Voigt LF, Cushing-Haugen KL, Lin MG, Yuan X, Daling JR. Relationship between menopausal hormone therapy and risk of ductal, lobular, and ductal-lobular breast carcinomas. *Cancer Epidemiol Biomarkers Prev*. Jan;17(1):43-50. 2008.
- Mathes RW, Malone KE, Daling JR, **Porter PL**, Li CI. Relationship between histamine2-receptor antagonist medications and risk of invasive breast cancer. *Cancer Epidemiol Biomarkers Prev*, Jan;17(1):67-72. 2008.
- Gadi VK, Malone KE, Guthrie KA, **Porter PL**, Nelson JL. Case-control study of fetal microchimerism and breast cancer. *PLoS ONE*. Mar 5;(3):e1706. 2008. PMID: PMC2248618.
- Reding KW, Daling JR, Doody DR, O'Brien CA, **Porter PL**, Malone KE. Effect of prediagnostic alcohol consumption on survival after breast cancer in young women. *Cancer Epi. Biomarkers Prev* 17:1988-1996, 2008. PMID: PMC2605937
- Mathes, RW, Malone KE, Daling JR, Davis S, Lucas SM, **Porter PL**. Migraine in postmenopausal women and the risk of invasive breast cancer. *Cancer Epi. Biomarkers Prev* 17:3116-3122. 2008. PMID: PMC2692343
- Loo LW, Ton C, Wang YW, Grove DI, Bouzek H, Vartanian N, Lin MG, Yuan X, Lawton TL, Daling JR, Malone KE, Li CI, Hsu L, and **Porter PL**. Differential Patterns of Allelic Loss in Estrogen Receptor-Positive Infiltrating Lobular and Ductal Breast Cancer. *Genes, Chrom, Cancer*, 47(12):1049-1066, 2008. PMID: 18720524
- Beaber EF, Holt VL, Malone KE, **Porter PL**, Daling JR, Li CI. Reproductive factors, age at maximum height, and risk of three histologic types of breast cancer. *Cancer Epidem. Biomarkers Prev* 17:3427-3434, 2008. PMID: PMC2652475
- Phipps AL, Malone KE, **Porter PL**, Daling JR, Li CI. Reproductive and hormonal risk factors for postmenopausal luminal, HER-2-overexpressing, and triple-negative breast cancer. *Cancer* 113:1521-1526. 2008. PMID: PMC2587413
- Lund MJ, Trivers KF, **Porter PL**, Coates RJ, Leyland-Jones B, Brawley OW, Flagg EW, O'Regan RM, Gabram SG, Eley JW. Race and triple negative threats to breast cancer survival: a population-based study in Atlanta, GA. *Breast Cancer Res Treat* 2009; 113(2):357-370. 2009. PMID: 18324472.
- Trivers KF, Lund MJ, **Porter PL**, Liff JM, Flagg EW, Coates RJ, Eley JW. The epidemiology of triple-negative breast cancer, including race. *Cancer Causes Control*, 2009 Apr 3. [Epub ahead of print] PMID: 19343511
- Dolle JM, Daling JR, White E, Brinton LA, Doody DR, **Porter PL**, Malone KE. Risk factors for triple-negative breast cancer in women under the age of 45 years. [Cancer Epi. Biomarkers Prev](#). 2009 Apr. 18(4):1157-66. PMID: PMC2754710
- Li CI, Daling JR, **Porter PL**, Tang MC, Malone KE. Relationship between potentially modifiable lifestyle factors and risk of

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

second primary contralateral breast cancer among women diagnosed with estrogen receptor positive invasive breast cancer. *J Clin Oncol* 2009;27(32):5312-8. PMID: 19738113; PMCID: PMC2773216.

Li CI, Daling JR, **Porter PL**, Tang MC, Malone KE. Adjuvant Hormonal Therapy for Breast Cancer and Risk of Hormone Receptor-Specific Subtypes of Contralateral Breast Cancer. *Cancer Research*, 2009; 69:6865-6870. NIHMSID:NIHMS128803.

Porter PL. Global trends in breast cancer incidence and mortality. *Salud Publica Mex.* 2009;51 Suppl 2:s141-6. PMID: 19967268

Harigopal M, Barlow WE, Tedeschi G, **Porter PL**, Yeh IT, Haskell C, Livingston R, Hortobagyi GN, Sledge G, Shapiro C, Ingle JN, Rimm DL, Hayes DF. Multiplexed assessment of the Southwest Oncology Group-directed Intergroup Breast Cancer Trial S9313 by AQUA shows that both high and low levels of HER2 are associated with poor outcome. *Am J Pathol*, 2010;176(4):1639-47. PMID: 20150438

D. Research Support

P30 CA015704-29 (LELAND HARTWELL, PHD)

NIH/NCI CANCER CENTER SUPPORT GRANT – MAJOR PROGRAM HEADS

THE CANCER CENTER SUPPORT GRANT SUPPORTS THE LEADERSHIP AND ADMINISTRATIVE FUNCTIONS OF THE FRED HUTCHINSON CANCER RESEARCH CENTER. THIS GRANT PROVIDES SALARY SUPPORT FOR PROGRAM HEADS. ROLE: PROGRAM CO-HEAD

R01 CA098415 (Peggy L. Porter, MD) 08/01/04-05/31/10

NIH/NCI Gene Copy Number Changes and Breast Cancer Survival

THIS PROJECT BRINGS TOGETHER AN INTERDISCIPLINARY TEAM SKILLED IN GENOMICS, PATHOLOGY, EPIDEMIOLOGY, BIostatISTICS AND CLINICAL RESEARCH TO: 1) IDENTIFY FREQUENT LOSSES AND GAINS OF GENETIC MATERIAL USING ARRAY CGH ANALYSIS ON A LARGE SET OF PURIFIED BREAST TUMOR SAMPLES AND 2) DETERMINE THE RELATIONSHIP BETWEEN SPECIFIC REGIONS OF COPY NUMBER CHANGE AND PARTICULAR PATIENT AND TUMOR ATTRIBUTES. ROLE: P.I.

R01 CA098858 (Kathleen E. Malone, PhD) 09/15/04-06/30/10

NIH/NCI Breast Cancer Prognostic Factors/Pathology

This population-based molecular-epidemiologic cohort study will examine factors that predict mortality in women diagnosed with invasive breast cancer at ages 45-79. The overall goal of the study is to evaluate patient and tumor characteristics for their relationship with the risk of breast cancer mortality. Role: Co-Invest.

BC045034 (Christopher I. Li, MD, PhD) 09/15/05-09/14/10

DOD Breast Cancer Research Program; Use of Exogenous Progestins and Risk of *in situ* and Invasive Breast Cancer. This award involves two projects. The first project investigates the relationship between use of depo-medroxyprogesterone acetate on risk of in situ breast cancer among premenopausal women 20-44 years of

age. The second study is a population-based case-control study evaluating the relationship between use of progestin containing hormone therapy regimens and risk of invasive pure lobular, ductal/lobular, and ductal carcinomas among postmenopausal women 55-74 years of age. This study will also assess the epidemiologic, pathologic, and molecular differences between these three histologic types of breast cancer. Role: Co-Invest.

R01 CA105041 (Christopher I. Li, MD, PhD) 09/26/05-06/30/10

NIH/NCI; Depo-Prevera and Breast Cancer: Epidemiology/Pathology

The primary objective of this study is to assess the relationship between DMPA use and breast cancer risk among young women in a large population-based study. Role: Co-Investigator

R01 CA118981 (Susan Nowell Kadlubar, PhD)

09/27/06-07/31/11

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

NIH/NCI; Pharmacogenetics of Hormonal Therapy For Breast Cancer

The major goal of this project is to examine the role of pharmacogenetics in the efficacy of adjuvant therapy with the aromatase inhibitor, anastrozole, compared to anastrozole combined with the pure antiestrogen, fulvestrant, for metastatic breast cancer in postmenopausal patients. Role: Co-Investigator

U24 CA126476 (STEVEN A. CARR, PHD)
11/01/06-02/28/10

NIH/NCI; CPTAC: MEASURING CANCER BIOMARKER CANDIDATES BY TARGETING MS AND AB ENRICHMENT

The goal of this study is to assess the robustness of a high-throughput mass spectrometric technology platform for quantitative measurement of multiple candidate biomarker proteins in complex samples such as human plasma. Role: Co-Investigator

Entertainment Industry Foundation (Leland H. Hartwell, PhD) 06/01/07-09/30/10

EIF Breast Specimen Core

The main goal of this core is to collect and distribute blood and tissue specimens for analysis of plasma proteins.

Role: Co-Investigator

PO1 CA042792 (Denise A. Galloway, PhD) 04/10/87-06/30/12

NIH/NCI; HPV: Biology, Clinical Significance and Epidemiology.

Core B: Pathology, Role: Core Director. Core B functions to centralize tissue acquisition and tracking and provide a laboratory base for human and murine tissue review and processing.

R01 CA118914 (Scott Davis, PhD) 09/26/07-07/31/12

NIH/NCI; Breast Cancer Risk and Molecular Change after Chernobyl

The purpose is to investigate whether individual radiation dose to the breast from the Chernobyl accident is associated with breast cancer risk, and to evaluate the relationship of breast cancer phenotype and genotype to radiation dose by comparing rates of inactivating genetic or epigenetic changes in 14 selected DNA repair genes to radiation dose. Role: Co-Investigator

RC1 CA146456 (Hannah Linden, MD) 10/01/09-09/30/11

NIH/NCI; Measures of Endocrine Sensitivity in Early Breast Cancer

This proposal will test drug efficacy in the "window of opportunity" period between the diagnosis of cancer and surgery as well as explore the extent to which imaging measures and gene expression assays can provide biologic insight into factors mediating tumor sensitivity and resistance to therapy. Role: Co-Investigator

RC2 CA148286 (Paulovich, A., Carr, S.) 09/30/2009-09/29/2011

NIH/NCI; Measurement of Cancer-Associated Biomarker Proteins in Complex Biological Samples Using Multiplex Technologies

This proposal is a pilot study to assess feasibility and scalability of a human proteome detection and quantitation project (hPDQ). Role: Co-Investigator

R01 CA097271-06 (Christopher I. Li, MD, PhD) 03/01/10-03/31/15

NIH/NCI; Risk Factors For The Secondary Primary Breast Cancer Among DCIS Survivors

The proposed study is a competitive renewal of our currently funded project that is investigating how epidemiological factors, clinical and pathological characteristics, and tumor marker expression influence the risk of second primary invasive contralateral breast cancer among survivors of a first primary invasive breast cancer. Role: Co-Investigator

P50 CA148143 (Beti Thompson, PhD) 05/01/10-04/30/15

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

NIH/NCI; Understanding and preventing breast cancer disparities in Latinas
 The four projects and four cores of this P50 application focus researchers from several disciplines on the overarching theme: to understand and prevent pre-cursors of breast cancer and reduce breast cancer morbidity and mortality among Latinas. Role: Project Leader

3.9: BIOGRAPHICAL SKETCH
 Provide the following information for each of the key personnel in the order listed in section 3.6. Repeat this format for each person.

Name: Wong, Rebecca				<i>Position/Title:</i> Professor, Department of Preventive Medicine and Community Health, University of Texas Medical Branch (UTMB)			
<i>Education/Training Medical Doctor and MPH. Public Health</i>							
<i>Institution and Location</i>	<i>Degree(s) (If applicable)</i>	<i>Year(s)</i>	<i>Field(s) of Study</i>				
Universidad Nacional Autónoma de Mexico, Mexico City	B.S.	1981	Actuarial Science				
University of Michigan, Ann Arbor, MI	M.A.	1983	Applied Economics				
University of Michigan, Ann Arbor, MI	Ph.D.	1987	Economics				

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

Positions and Honors

1977-1978	Statistical Analyst, Sampling & Statistics Office, Secretary of Budget & Programming, Mexico City
1978-1979	Junior Researcher, Evaluation Office, Secretary of Public Education, Mexico City
1979-1981	Senior Researcher, Biostatistics Office, Secretary of Health. Mexico City
1980-1983	Assistant Professor of Mathematics for Soc Sciences, Universidad Autónoma Metropolitana, Mexico City
1983	Teaching Assistant, Department of Statistics, University of Michigan, Ann Arbor, MI
1984	Research Assistant and Fellow, Population Studies Center, University of Michigan
1986	Visiting Fellow, Center for Population Studies, Harvard University
1987-1997	Assistant Prof, Johns Hopkins University Depart of Population Dynamics, School of Public Health
1997-1998	Research Assistant Professor, Georgetown University Department of Demography
1998-2001	Research Associate Professor, Georgetown University Department of Demography
Maryland	
2006-2007	Senior Research Scientist, Maryland Population Research Center, University of Maryland
2004-2007	Associate Director, Maryland Population Research Center, University of Maryland
2008-Present	Professor, Department of Preventive Medicine and Community Health, University of Texas Medical Branch (UTMB)
2008-Present	Director, WHO/PAHO Collaborating Center on Aging and Health, UTMB
2008-Present	Senior Fellow, Sealy Center on Aging, UTMB
2009-Present	P & S Kempner Distinguished Professor in Health Disparities, UTMB.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

1997-2004 Adj. Faculty, Johns Hopkins University Department of Population and Family Health Sciences
 2001-2006 Associate Research Scientist, Maryland Population Research Center, University of Maryland
 2006-2007 Senior Research Scientist, Maryland Population Research Center, University of Maryland
 2004-2007 Associate Director, Maryland Population Research Center, University of Maryland
 2008-Present Professor, Department of Preventive Medicine and Community Health, University of Texas Medical Branch (UTMB)
 2008-Present Director, WHO/PAHO Collaborating Center on Aging and Health, UTMB
 2008-Present Senior Fellow, Sealy Center on Aging, UTMB
 2009-Present P & S Kempner Distinguished Professor in Health Disparities, UTMB.

Other Experience and Professional Memberships

1994-1996 Member, Minority Biomedical Research Support Review Panel, NIH, National Institute of General Medical Sciences, Behavioral Sciences
 1996-1997 Member, Special Review Committee, Site Visit, NIH/NICHD
 1998 Member, Small Grant Review in Economics, Special Emphasis Panel, NIH/NIA
 1998-1999 Ad hoc Reviewer, NIA Interagency Agreements, NIH/NIA
 1999 Consultant, Gender and Aging in Mexico, The World Bank
 1998-Present Member, Editorial Board, *Papeles de Población* (Papers on Population), Center for Research and Advanced Studies on Population, Autonomous University of Mexico
 2002-2003 Member, International Evaluation Committee for the Interamerican Research Award on Social Security Research, Interamerican Conference on Social Security
 2002-2003 Consultant, U.S. Census Bureau, Binational Project on Mexico-U.S. Migration
 2002-Present Member, International Outreach Committee, Population Association of America
 2002-2005 Member, Advisory Board Project SABE (Health, Aging and Wellbeing of the Elderly in the Americas), Pan American Health Organization
 2005-2007 Member, Special Emphasis Review Panel, Social Science and Population Studies, NIH
 2004-2007 Deputy Editor, *Demography*, Maryland Population Research Center and Johns Hopkins Population Center
 2003-Present Member, Panel on Aging in Developing Countries, International Union for Scientific Study of Population
 2006-Present Member, Editorial Board, *Journal of Aging and Health*
 2008-2012 Member, Social Sciences and Population Studies Study Section, NIH

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

A. Selected peer-reviewed publications or manuscripts in press (in chronological order)

- Wong R, Espinoza Higgins M (2003). Income and assets of the population of middle and old age in Mexico. *Papeles de Población*, 9(37):129-166.
- Hill K, Wong R (2005). Mexico-US migration: Views from both sides of the border. *Population and Development Review*, 31(1):1-+. ISI:000228983100001.
- Patel KV, Peek MK, Wong R, Markides KS (2006). Comorbidity and disability in elderly Mexican and Mexican American adults: findings from Mexico and the southwestern United States. *J Aging Health*, 18(2):315-329. PM:16614346.
- Wong R, Díaz JJ, Espinoza Higgins M (2006). Health care use among elderly Mexicans in the United States and Mexico: The role of health insurance. *Research on Aging*, 28(3):393-408. ISI:000236849900009.
- Wong R, Díaz JJ (2007). Health care utilization among older Mexicans: health and socioeconomic inequalities. *Salud Pública de México*, 49(Suppl 4):505-514. PM:17724524.
- Wong R, Espinoza Higgins M, Palloni A (2007). Mexican older adults with a wide socioeconomic perspective: health and aging {original in spanish}. *Salud Pública de México*, 49 (Suppl 4):436-447. PM:17724516.
- Wong R, Palloni A, Soldo BJ (2007). Wealth in middle and old age in Mexico: The role of international migration. *International Migration Review*, 41(1):127-151. ISI:000244031200005.
- Wong R (2007). Aging in Latin America and the Caribbean. In: Markides KS, editor. *Encyclopedia of Health & Aging*. Sage Publications, Inc., 317-319.
- Wong R, Higgins M (2007). Dynamics of intergenerational assistance in middle- and old-age in Mexico. In: Angel JL, Whitfield KE, editors. *The health of aging Hispanics: the Mexican-origin population*. New York: Springer, 99-120.
- Wong R, Ofstedal MB, Yount K, Agree EM (2008). Unhealthy lifestyles among older adults: exploring transitions in Mexico and the US. *European Journal of Ageing*, 5(4):311-326. ISI:000260837200005.
- Wong R (2008). Are we asking the right questions on intergenerational ties? In: Booth A, Crouter AC, Bianchi SC, Seltzer JA, editors. *Intergenerational Caregiving*. Washington, D.C.: The Urban Institute Press, 45-51. <http://www.urban.org/books/intergenerationalcaregiving/content.cfm>.
- Markides KS, Salinas JJ, Wong R (2009). Aging and health among Hispanics/Latinos in the Americas. *International Handbook of Social Gerontology*. Sage Publications, Inc..
- Puig A, Pagan JA, Wong R (2009). Assessing quality across healthcare subsystems in Mexico. *J Ambul Care Manage*, 32(2):123-131. PM:19305224.
- Wong R, Palloni A (2009). Aging in Mexico and Latin America. In: Uhlenberg P, editor. *International Handbook of Population Aging*. New York: Springer, 231-252.
- Wong R, DeGraff DS (2009). Old-age wealth in Mexico: The role of reproductive, human capital, and employment decisions. *Research on Aging*, 31(4):413-439.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI)

Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

B. Research Support:

Ongoing

NIA/NIH No. AG25533 (R. Wong, P.I.)

9/1/05-6/30/10

National Institute on Aging

Health Conditions among Elderly in Latin America

The overall goal of the study is to examine patterns, transitions, and identify determinants of health among the elderly in a comparative framework within countries of the Latin American and Caribbean region. The study seeks to contrast patterns within the region and also among those found in the U.S., in particular with populations of Mexican origin, taking advantage of recently gathered, high-quality, comparable, and as of yet under-analyzed survey data on elderly people. The specific aims of the project are: to estimate profiles and determinants of health status, disability and diabetes and the main risk factor, obesity, in seven countries in Latin America and the Caribbean using the Health and Wellbeing Survey (SABE); to examine health and disability transitions and mortality in a nationally representative sample of Mexico using the 2001 and 2003 waves of the Mexican Health and Aging Study (MHAS); and to contrast profiles of health and disability status and mortality in the Mexican sample and among Mexican immigrants to the U.S., native population in the U.S., and returning Mexican migrants in Mexico. The emphasis is on the role of early childhood conditions, experiences with illness, and on the influence of income and wealth. The study adds to and fine-tunes existing methods and procedures to help address two issues: health selection among immigrants to the U.S. and estimation of couple-models to assess the effects of selected determinants on health and mortality net of shared attributes. The study uses data from the MHAS, SABE, the Health and Retirement Survey (HRS), the National Death Index (NHIS-NDI), the National Health and Nutrition Examination Survey (NHANES) and the National Longitudinal Study of Mortality (NLMS).

Role on Project: PI (Parallel with Alberto Palloni, Northwestern University).

NICHD/NIH No. 051764 (A. Pebley, P.I.)

7/1/07-6/30/12

National Institute of Child and Human Development

Social Disparities in Health among Latinos

The project aims to examine variations in social gradients in health behaviors and outcomes for Latinos and other ethnic groups in Los Angeles County and the United States by national origin, nativity, and timing of immigration; to assess the causes of weaker social gradients in health among Latinos; and to investigate the reasons why Latinos report lower self-rated health than other ethnic groups despite their apparent superiority in health. The study uses data for the U.S. populations from the Los Angeles Family and Neighborhood Survey (L.A. FANS) and the National Health Interview Survey (NHIS), and estimates comparable models in Mexico using data from the Mexican National Health Survey (ENSA). The Mexican survey will be linked to municipality-level data using the 2000 Mexican Population Census, containing aggregate measures of socioeconomic attributes and migration levels to the U.S.

Role on Project: Co-Investigator.

INTERNATIONAL ETHNIC RESEARCH INITIATIVE (GSK ERI) Grant Application

Principal Investigator(s): Felicia Marie Knaul, PhD

Research Title: Age of onset of breast cancer in Latin America and the Caribbean: a multidisciplinary approach to understanding determinants and health policy implications

NIA/NIH No. 10939-15 (K. Markides, P.I.)

07/01/09-3/31/14

National Institute on Aging

Hispanic – Established Populations for the Epidemiological Study of the Elderly (HEPESE)

Longitudinal Study of Mexican American Elderly Health. The major goal of this project is to conduct a longitudinal study of 3,050 elderly Mexican Americans in the Southwest United States; estimate prevalence and incidence of major conditions and disabilities and compare with other populations; study predictors of mortality and change in health over time. Baseline was conducted in 1992. Additional 1,000 subjects were added after 10th year.

Role on Project: Co-Investigator

Completed

NIA/NIH No. 1R03 AG026509

07/01/06-06/30/08

National Institute on Aging

The Past Context: Supplementing Survey Data on Aging

The project aims to supplement household data gathered through personal interviews in late life in a previous study, the Mexican Health and Aging Study 2001, with secondary data that captures details of the conditions that prevailed at the time individuals made particular decisions through their life cycle. The aim is to evaluate the hypothesis that indicators about the earlier-life context can provide further details for modeling late-life well being, beyond what age cohort indicators can provide. Data files with historical events in Mexico 1900-2000, as well as historical censuses 1900-2000 are used as secondary sources.

Role on Project: PI

SECTION 4: BUDGET AND BUDGET JUSTIFICATION¹

Please submit your proposed budget and budget justification on the attached Excel Budget Form

*** budget is attached as a separate excel document, entitled: GSK ERI Grant Budget Form, July 15 2010 final