HEALTH IN AFRICA AND THE POST-2015 MILLENIUM DEVELOPMENT AGENDA: A THREE DAY SYMPOSIUM

Conference Program & Abstracts

May 20-22, 2015

The Conference Center
Hawthorn Suites
101 Trade Center Drive,
Champaign, IL 61820
Phone: (217) 398-3400

Health in Africa

and the Post-2015 Millennium Development Agenda

University of Illinois at Urbana-Champaign

May 20 - 22, 2015

VENUE:
The Conference Center
at Hawthorn Suites
101 Trade Center Drive
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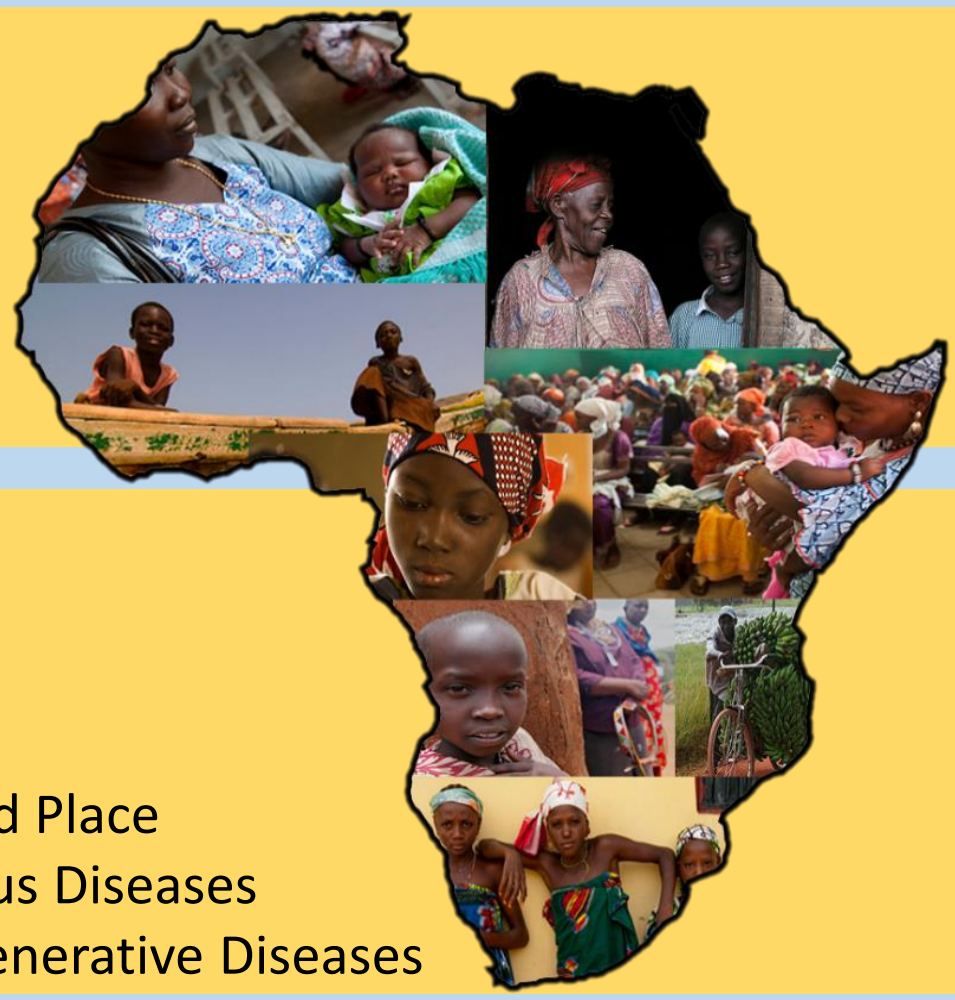
(217) 398-3400



PANELS:

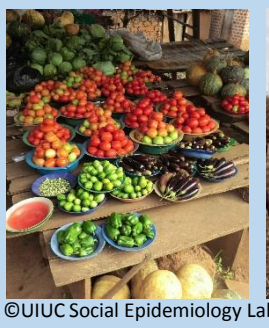
- Food Security, Nutrition, and Health
- Infant, Child, and Maternal Health
- Provision of Health Care Services
- Geographic Perspectives: Health and Place
- Emerging and Re-emerging Infectious Diseases
- Aging and Non-communicable/Degenerative Diseases

Please contact the Conference Organizers for more information:

Diana Grigsby-Toussaint, PhD
dgrigs1@illinois.edu
Department of Kinesiology
and Community Health
(217) 333-9207

Juliet Iwelunmor, PhD
jiwez@illinois.edu
Department of Kinesiology
and Community Health
(217) 333-2307

Ezekiel Kalipeni, PhD
kalipeni@illinois.edu
Department of Geography
and GIScience
(217) 244-7708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College of Liberal Arts & Sciences AT ILLINOIS

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ORGANIZING COMMITTEE

Juliet Iwelunmor, Department of Kinesiology and Community Health, University of Illinois
Ezekiel Kalipeni, Department of Geography and GIScience, University of Illinois
Diana Grigsby-Toussaint, Department of Kinesiology and Community Health, University of Illinois

SPECIAL THANKS

Linda West, Dept. of Kinesiology and Community Health
Sarah Blackstone, Graduate Student Assistant, Dept. of Kinesiology and Community Health
Lori Baker, School of Earth, Society and Environment
Matthew Cohn, Department of Geography and Geographic Information Science
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College of Business

REGISTRATION

This symposium is free and open to the public.
For more information on this symposium send an email to the conference email address: africa2015mdgconf@gmail.com or contact any of the following individuals

Juliet Iwelunmor
Department of Kinesiology and Community Health
University of Illinois at Urbana-Champaign
123 Huff Hall, 1206 S. Fourth Street
Champaign, IL, 61820
Tel. (217) 333-2307
E-mail: jiwez@illinois.edu

Diana Grigsby-Toussaint
Department of Kinesiology and Community Health
College of Applied Health Sciences
2019 Huff Hall, 1206 South Fourth Street
Champaign, IL, 61820
Phone: (217)333-9207
Email: dgrigs1@illinois.edu

Ezekiel Kalipeni
Department of Geography & GIScience
University of Illinois at Urbana-Champaign
245 Computing Applications Building, M/C 150
605 East Springfield, Champaign, IL 61820
Tel. (217) 244-7708
kalipeni@illinois.edu

PROGRAM FORMAT

The presenter of each paper is the person named first in the list of authors although this may not necessarily be true for other papers. A list of invited participants and their affiliations and other details is given at the end of this program.

INSTRUCTIONS FOR SESSION CHAIRS

Please arrive at the conference site in good time well before your assigned session is due to begin. Greet the presenters and be sure you can pronounce their names correctly. When the session starts introduce yourself and each presentation in turn. Unless otherwise specified, each presentation is allocated 15 minutes plus 10 minutes for discussion afterwards as a group. Please indicate to the presenter when 3 minutes of their allocated time remains. Do not allow the

presentation to run over the 15-minute limit. If necessary ask that any additional questions be deferred until the break.

INSTRUCTIONS FOR PRESENTERS

Please arrive in the conference room at the Hawthorn Suites 10 minutes before your assigned session is due to begin and introduce yourself to the session chair. The room will be equipped with a presentation computer and LCD projector. If there are any problems with your presentation, someone will be present to assist with computer difficulties should they arise. Unless otherwise specified, you have been allocated 15 minutes presentation time plus 10 minutes discussion after all the presentations. The chair will inform you when 3 minutes of your presentation time remains. The complete presentation will be terminated after 15 minutes.

PUBLICATION PLANS

Selected papers will be published in special issues of two or three prominent global health journals. The conference organizers are in consultation with the following three journals which have shown a keen interest to consider publication of a set of papers from the conference: *Global Public Health* (Columbia University, New York), *Journal of Global Health* (Edinburgh University, UK), *Globalization and Health*. We are also in talks with the editors of the *Bulletin of the World Health Organization* to see if they might be interested in publishing a set of the papers. Papers will be peer-reviewed following the policies of these three journals. Only electronic submissions will be accepted. Submissions must be formatted in Microsoft Word. The documentation and stylistic standards of each article will have to conform to the requirements of the selected journal. The instructions to do so will be provided once papers are assigned to either of the journals by the symposium organizing committee.

CONFERENCE SITE AND HOTEL ACCOMMODATION

a) Conference Site: The Conference Center at Hawthorn Suites, 101 Trade Center Drive, Champaign, Illinois 61820, Tel.: (217) 398-3400. The conference will take place on May 20-22, 2015 (see maps and directions at the end of this program).

b) Hotel Accommodation

For those that are being financially sponsored by the symposium, Hotel Accommodation has been booked at the Hawthorn Suites Hotel at 101 Trade Center Drive, Champaign, Illinois 61820, Tel.: (217) 398-3400. Note that the hotel will provide bed and breakfast. Make sure to have your breakfast in good time before the start of the conference program. See program below for times. If you are driving to Champaign, a map of the location is attached below. The Hotel has ample parking. If you are coming by air to the Champaign airport (Willard Airport), the Hotel will provide a shuttle free of charge to pick you up at the airport, but you will need to call them using the courtesy phone provided at the airport. If you could provide your travel itinerary long before your trip to the conference organizers, they will make sure to arrange for the Hotel Shuttle or the conference van to come and pick you up from the airport to take you to the Hotel.

The Hotel will also provide a shuttle to and from the Conference Venue during the three day seating of the symposium.

For those who are self-sponsored, financially, the Urbana-Champaign area has numerous hotels available and can be easily Googled. Maps for directions once in Urbana-Champaign are provided at the end of this program. If you need more detailed directions to any of these sites please get in touch with the conference organizers.

Health in Africa and the Post-2015 Millennium Development Agenda: A Three Day Symposium
University of Illinois at Urbana-Champaign
May 20-22, 2014

Conference Program

TUESDAY, MAY 19
Arrival of participants at the Hawthorn Suites Hotel, 101 Trade Center Drive, Champaign, Illinois 61820, Tel.: (217) 398-3400.

WEDNESDAY, MAY 20

7:45 am	**Registration**
8:00-8:30	**Welcome Remarks**
	Professor Diana Grigsby-Toussaint (Welcome Remarks and Introductions)
	Dean Barbara Wilson, Harry E. Preble Dean, Kathyrn Lee Baynes Dallenbach Professor, College of Liberal Arts & Sciences
	Dean Tanya M. Gallagher, Dean of the College of Applied Health Sciences
8:30-8:45	**Introduction** Juliet Iwelunmor, Diana Grigsby-Toussaint, Ezekiel Kalipeni, University of Illinois at Urbana-Champaign
Session 1:	**New Emerging Infectious Diseases** Chair: Diana S. Grigsby-Toussaint
8:45-9.20	**Plenary Talk**: Dr. Mosoka P. Fallah: Head of Case Detection Montserrado Incident Management System (M-IMS) Ministry of Health and Social Welfare, Republic of Liberia *Using mHealth to address Ebola in Liberia*
9:20-9:35	Alexandra Shapiro (Colgate University, New York), Jenna Bryfonski,

	Anna Hoefler, Ezekiel Kalipeni *Examining the West African Ebola Outbreak through the Application of the Disease Ecology Framework*
9:35-9:50	Guy-Lucien S. Whembolua (University of Cincinnati, Ohio), Koffi N. Maglo, Daudet Ilunga Tshiswaka, Donaldson Conserve, Muswamba Mwamba, Darly Kambamba *The sociocultural factors associated with epidemics: The case of the 2014 Ebola Outbreak*
9: 50-10:00	**Questions**
10:00-10: 10	**Break**
Session 2:	**Challenges and Opportunities for Health in Africa** Chair: Jenna Dixon
10:10-10:25	Elizabeth Wachira (Texas Woman's University), Joseph R. Oppong *A Political Ecology of Africa's Brain Drain Crisis*
10:25:10:40	Imelda K. Moise (USAID funded MEASURE Evaluation and John Snow Inc.), Serge Bisore, Jean Pierre Rwantabagu, Florence Munezero, Asmini Hassan, Longin Gashubije, Sublime Nkindiyabarimakurinda, and Moussa Ly, *A Partner Mapping Exercise to Inform Aid Coordination and Management for Health System Strengthening in Burundi*
10:40-10:55	Antar Jutla (West Virginia University, West Virginia), Thanh Huong, Nguyen, Juliet Iwelunmor, *Managing burden of diarrheal diseases in Sub-Saharan Africa*
10:55-11:10	Vincent Z. Kuuire (University of Western Ontario, Canada), Joseph Kangmennaang1, Kilian N. Atuoye, Sierra Vercillo, Sheila Boamah, Roger Antabe, Jonathan A. Amoyaw, Isaac Luginaah *Timing and Utilization of Antenatal Care Service in Nigeria and Malawi*
11:10-11:20	**Questions**
Session 3:	**Towards Sustainable Solutions for Health in Africa** Chair: Charles Nzioka
11:20-11:35	Nguyen, Thanh Huong (University of Illinois, Urbana Champaign, Illinois), Juliet Iwelunmor, Wu Chi-Fang,Patrick Degnan, Joanna Shisler, *The role of water, climate change and sustainable solutions for health in Africa*

11:35-11:50	Juliet Iwelunmor, Sarah Blackstone, Ezekiel Kalipeni (University of Illinois, Urbana Champaign, Illinois), Collins Airhihenbuwa, Gbenga Ogedegbe *Sustainability of health interventions in Africa: What is it and why does it matter?*
11:50-12:00	**Questions**
12:00-12:15	**Remarks from Provost Adesida**
12:20-1:20	**Lunch**
Session 4:	**Food Security, Nutrition and Health** Chair: Joseph Oppong
1:20-1:35	Hanson Nyantakyi-Frimpong (The University of Western Ontario, Canada), Rachel Bezner Kerr *Health, Food Security and Nutrition in Africa and the Post-2015 MDGs: Lessons from Ghana and Malawi*
1:35-1:50	Richard Bukenya (University of Illinois-Urbana Champaign), Joyce Kinabo, Cornellio Nyaruhucha, Peter Mamiro and Juan Andrade *Assessment of Nutrient Adequacy of Complementary Foods for Infants and Young Children in Morogoro, Tanzania.*
1:50-2:05	John H. Muyonga (Makerere University, Uganda) *Can Return to Traditional African Foods Help Alleviate Malnutrition on the Continent of Africa?*
2:05-2:15	**Questions**
2.15-2:25	**Break**
Session 5:	**Aging and Noncommunicable/Degenerative Diseases** Chair: Lucy Mkandawire-Valhmu
2:25-2:40	Ama Pokuaa Fenny (University of Ghana, Accra, Ghana) *Live to 70 Years and over or Suffer in Silence: Understanding Health Insurance Status among the Elderly under the NHIS in Ghana*

2:40-2:55	Eric Y. Tenkorang (Memorial University of Newfoundland, St. John's, Canada), Vincent Z. Kuuire *Non-communicable Diseases in Ghana: Does the Theory of Social Gradient in Health Hold?*
2:55-3:10	Jude Saji (Health of Population in Transition [HoPiT] Research Group, Yaounde, Cameroon) *Weight Status Changes and Uncontrolled Urbanization in Cameroon: Current and Future Health Challenges*
3:10-3:25	Bizu Gelaye (Department of Epidemiology, Harvard T. H. Chan School of Public Health) *Lessons Learned: Non-Communicable Diseases Prevention and Control in Ethiopia*
3:25-:3:40	**Questions**
3:40-3:50	**Break**
Session 6	**Case Studies on Gender, Culture, and Health in Africa** Chair:Chinelo C. Okigbo
3:50-4:05	Ucheoma Nwaozuru (University of Illinois Urbana-Champaign, Illinois), Sarah R. Blackstone, Juliet Iwelunmor. *Perceptions of Childhood Malaria and Care-seeking Practices among mothers in Lagos, Nigeria*
4:05-4:20	Oyapero A. (Lagos State University Teaching Hospital), Ogunbanjo BO. *Maternal perception about early childhood caries at the Lagos State University Teaching Hospital, Ikeja*
4:20-4:35	Yewande Sofolahan-Oladeinde (University of Maryland Baltimore), D. F. Conserve, Juliet I. Iwelunmor *Exploring the Cultural Context of Managing HIV Serodiscordance in Intimate and Reproductive Relationships among Women Living with HIV/AIDS in Southwest Nigeria*
4:35-4:45	**Questions**
4:45-5:15	**Plenary Talk:** Dr Collins .O. Airhihenbuwa**,** Department of Biobehavioral Health, Penn State University, *Why Culture Matters in Bridging Gaps in Health Inequity Globally*
5:15-5:25	**Questions**
5:25-5:30pm	**Any pertinent announcements and adjournment of meeting for the**

day

6:30-8:00pm **Catered Dinner and Entertainment**

THURSDAY, MAY 21

7:30-8:15am **Tea/Coffee/Snacks in Conference Room**

Session 7: **Tackling the HIV/AIDS Epidemic**
Chair: Nanzen Kaphagawani

8:15-8:30 Charles Nzioka (Department of Sociology, University of Nairobi)
Grappling with the Challenges of Health Systems Strengthening in Response to HIV and AIDS in Kenya

8:30-8:45 Eliza Mary Johannes (IDA, Alexandria, Virginia)
Kenya's Progress towards Millennium Development Goal Six: Incorporating the Turkana Nomads Living with HIV/AIDS into Kenya's Health Policy Framework of 2012-2030

8:45-9:00 Rande Webster (Dominican University of California, San Rafael, CA), Jayati Ghosh, Ezekiel Kalipeni
Role of Education in Combating HIV/AIDS Crisis in South Africa: A Study of Youth and Teachers in the Eastern Cape City of Port Elizabeth

9:00-9:15 Jayati Ghosh (Dominican University of California, San Rafael, CA), Rande Webster, Ezekiel Kalipeni
HIV/AIDS Education in South African Schools: The Case of Youth Enrolled in a Township High School in the City of Port Elizabeth, South Africa

9:15-9:25 **Questions**

9:25-9:35 Break

Session 8: **Infant and Child Morbidity and Mortality**
Chair**:** Natasha Oyibo

9:35-9:50 Assata Zerai (University of Illinois at Urbana-Champaign, Illinois)
Hypermasculinity, State Violence, and MDG Shortfalls: Water, Sanitation, and Child Morbidity in Zimbabwe

9:50-10:05	Vissého Adjiwanou and Alehegn Worku Engdaw, Universtity of Cape Town, "Environmental Health Hazards and Under-Five Mortality in Sub-Saharan Africa: Analysis Using Multilevel Discrete-Time Hazard Model."
10:05-10:20	Ezekiel Kalipeni (University of Illinois at Urbana-Champaign), Poonam Jusrut *Assessing the Reduction of Infant Mortality Rates in Malawi over the 1990-2010 Decades*
10:20-10:35	Sarah R. Blackstone (University of Illinois Urbana-Champaign, Illinois), Ucheoma Nwaozuru, Juliet Iwelunmor *Why are children dying in Nigeria: Evidence from the 2013 Demographic Health Survey*
10:35-10:50	**Questions**
10:50-11:00	**Break**
Session 9	**Advancing the Health of Women and Children** Chair: Eliza Mary Johannes
11:00-11:15	Chinelo C. Okigbo (University of North Carolina at Chapel Hill, North Carolina), Korede K. Adegoke, Comfort Z. Olorunsaiye, *Assessing Reproductive Health Indicators in Nigeria from 1990-2013*
11:15-11:30	Sandra Darfour-Oduro (University of Illinois at Urbana-Champaign), Diana Grigsby-Toussaint *The Impact of Health Policies on Lifestyle Behaviors among Adolescent Girls in Sub-Saharan Africa*
11:30-11:45	Nanzen Caroline Kaphagawani (Malawi College of Health Sciences, Zomba, Malawi) *Factors Contributing to Teenage Pregnancy in Zomba District, Malawi: The Role of Cultural Beliefs, Contraceptive Use and Knowledge on Reproductive and Sexual Health*
11:45-12:00	Lucy Mkandawire-Valhmu (University of Wisconsin-Milwaukee, Milwaukee, Wisconsin) *Advancing the Health of Women and Children in Southern Malawi through Global Partnerships: An Analysis of One Academic-community Collaboration*
12:00-12:15	**Questions and Welcome Remarks from Provost Reitumetse Obakeng Mabokela**

12:20: 1:20	**Lunch**
Session 10:	**Maternal Morbidity/Mortality** Chair: Assata Zerai
1:20-1:35	Linda L. Semu (McDaniel College, Maryland) *Perilous Outcomes: The Intersection of Culture, Maternal Health (Mortality and Morbidity) and HIV/AIDS on Malawian Women in the Face of an International Development Consensus*
1:35-1:50	Natasha Oyibo (Middlesex University, London, UK), John Watt, Gordon Weller *Risk Communication as a Strategy for Tackling Maternal Mortality in Nigeria*
1:50-2:05	Kilian Atuoye (Western University, London, Canada), Jonathan A. Amoyaw, Vincent Z. Kuuire, Meghan McMorris, Sierra Vercillo, Sheila Boamah, Roger Antabe, Joseph Kangmennaang, Isaac Luginaah, *Access to and Utilization of Skilled Birth Attendants in the Context of MDG 5 in Sub-Saharan Africa*
2:05-2:20	**Questions**
2.20-2:30	**Break**
Session 11:	**Determinants and Prevention of Risk-Factors Influencing Health in Africa** Chair: Guy-Lucien S. Whembolua
2:50-3:05	Eric Y. Tenkorang (Memorial University, St. John's, Canada), Vincent Kuuire, Isaac Luginaah, Emmanuel Banchani. *Hypertension in Ghana: Prevalence and Risk Factors*
3:05-3:20	Joseph R. Oppong (University of North Texas, Denton, Texas), Emmanuel Aggrey-Korsah, Adobea Yaa Owusu, Regina Edziyie. *Unravelling Ghana's Market Fires – A Gendered and Structural Analysis*
3:20-3:35	Odujoko Tolulope (Lagos State University Teaching Hospital (LASUTH),Idris Oladipo, Ojomu Funke, Adedokun Ayoade: *The Effect of Spirituality on Medication Adherence among Hypertensive Patients at a Nigerian Teaching Hospital*

3:35-3:50	Gabriel Picone (Department of Economics, University of South Florida), *Determinants and Prevention of Low Birth Weight in sub-Saharan Africa: The Effects of Bed Net Distribution.*
3:50:4:05	**Questions**
4.05-4:15	**Break**
4:15-4:45	**Plenary Talk:** Dr. Charles Rotimi, Center for Research on Genomics and Global Health National Human Genome Research Institute National Institutes of Health, *Exploring the patterns and Determinants of Common Complex Diseases in the African Diaspora and Other Human Populations*
4:45-5:00	**Questions**
5:00 pm	**Announcements and Adjournment for the Day**
6:30pm	**Dinner at Hawthorne**

FRIDAY, MAY 22

7:30-8:30am:	**Tea/Coffee/Snacks in Conference Room**
Session 12:	**Health and Place** Chair: Jenna Dixon
8:30-8:45	Joseph R. Oppong (University of North Texas, Denton, Texas), Tschakert Petra *Vulnerable People, Vulnerable Places and Buruli Ulcer in Ghana*
8:45-9:00	Warangkana Ruckthongsook (University of North Texas, Denton, Texas), Joseph R. Oppong *The Impact of Land Use and Land Cover Change on the Spatial Distribution of Buruli Ulcer in Southwest Ghana*
9:00-9:15	Emmanuel Aggrey-Korsah (University of North Texas, Denton, Texas), Joseph R. Oppong: *Researching Urban Slum Health in Nima-Maamobi, Accra, Ghana*
9:15-9:30	James M. Ntambi (Departments of Biochemistry and of Nutritional Sciences, University of Wisconsin-Madison), Diana Grigsby-Toussaint *The Dual Burden of Diseases in Sub-Saharan Africa*
9:30-9:45	**Questions**
9:45-9:55	Break

Session 13	**Building and Measuring Capacity for Health Research in Africa** Chair: Isaac Luginaah
9:55-10:10	Bamidele Tayo (Loyola University, Stritch School of Medicine), Ogedegbe, Freddy Zizi, Albert Amoah, Richard Adanu, Gbenga Ogedegbe *A Novel Training Model to Build Capacity in Cardiovascular Health Research in Sub-Saharan Africa: Experience from the CaRT Institute*
10:10-10:25	Jenna Dixon (University of Waterloo, Canada), Susan J. Elliott, Elijah Bisung *Measuring What Matters: Toward a Global Index of Wellbeing*
10:25-10:40	Soazic Elise Wang Sonne (United Nations University-Maastricht, Maastricht, The Netherlands),Eleonora Nillesen *Long-term Effects of Violent Conflict on Second-generation Health Outcomes: Evidence from Liberia*
10:40-10:55	Kwadwo Boakye (University of North Texas, Denton, Texas), Joseph R. Oppong, Chetan Tiwari *Emergency Response Services in Ghana: The Case of Kumasi*
10:55-11:05	**Questions**
11:05-11:10	**Break**
Session 14	**Policy Implications of Health Research in Sub-Saharan Africa** Chair: Soazic Elise Wang Sonne
11:10-11:25	John Oryema (University of South Florida, Florida), Gabriel Picone *The Impact of Debt Relief on Child Mortality*
11:25-11:40	Julia Nonyerem Ogwunga (Alvan Ikoku Federal College of Education, Nigeria): *Recommendations and Future Directions for the Millennium Development Goals: Mental Health a Must Inclusion – Spotlighting Nigeria*
11:40-11:50	**Questions**
Session 15	**Concluding Roundtable Discussions** Chairs: Juliet Iwelunmor, Diana Grigsby-Toussaint and Ezekiel Kalipeni
11:50-12.20	Way Forward: Recommendations, Future Directions and Outcomes of Symposium
12:20	**Lunch/Official Adjournment of Conference**

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Paper Abstracts

Vissého Adjiwanou and Alehegn Worku Engdaw, Universtity of Cape Town, *"Environmental Health Hazards and Under-Five Mortality in Sub-Saharan Africa: Analysis Using Multilevel Discrete-Time Hazard Model."*

This study assesses the effect of household environmental health hazards on under-five mortality in sub-Saharan Africa. The study used DHS data sets of the following 12 countries in the region: Burkina Faso, Burundi, Cameroon, Cote d'Ivoire, Ethiopia, Gabon, Guinea, Malawi, Niger, Rwanda, Senegal and Zimbabwe. The study employed principal component method to construct an index of the level of household environmental health hazards based on the following indicators: water source, type of toilet facility, flooring material, type of wall, type of roof, type of cooking fuel and location of water source. A multilevel discrete-time hazard model was used to assess the relationship between the environmental index and under-five mortality. The study indicates that an assessment of the effects of household environmental hazards on under-five mortality without taking into account interaction between the environment and the age of the child undermines the importance of environmental factors. More specifically, the study finds a significant effect of the index of household environmental health hazards on under-five mortality in three countries: Burundi, Niger and Rwanda. By contrast, an assessment of interaction effects indicates that its effect on the risk of death depends on the age of the child in eight of the countries: Burkina Faso, Burundi, Cameroon, Guinea, Malawi, Niger, Rwanda and Senegal. Increasing levels in the index of household environmental health hazards is consistently associated with increasing risk of death during 24-59 months after birth. For a unit increase in the index of household environmental health hazards, the odds of risk of death increases by 18 percent in Burkina Faso to 33 percent in Senegal in this age interval. Its effect is less noticeable among young children. The study concludes that improvement in household environmental conditions can reduce the risk of mortality during late childhood. Therefore, policies and interventions, which aim to improve environmental health, should make use of this differential effect for better success in the region.

Keywords: environment, health hazards, children, Sub-Saharan Africa

Emmanuel Aggrey-Korsah and Joseph R. Oppong (University of North Texas, Texas), *"Researching urban slum health in Nima-Maamobi, Accra, Ghana."*

Urban slums of developing countries pose serious threats to global health. Slums are homes to 43% of combined urban populations in developing countries and about 78% of the urban population in least developed countries. The spatial concentration of squalid conditions, overcrowded housing, and concentrated poverty makes residents vulnerable to contracting and spreading diseases. While vulnerability to disease is inevitably tied to specific places, the dynamics of disease spread and prevalence in urban slums of developing countries remain unclear. This research examined how conditions in Nima-Maamobi make them vulnerable to

diseases. Demographic and housing data for this study came from the 2000 Population and Housing Census while health data was derived from the Women's Health Study of Accra, 2008-2009. Using the vulnerability framework and cluster analysis, we show how vulnerability and disease patterns vary within Nima-Maamobi. Our results show that the more developed southern part of the study area is less vulnerable and has lower rates of communicable diseases but much higher rates of non-communicable diseases. More vulnerable areas had high rates of communicable diseases while less vulnerable areas had lower rates. Clearly, Nima-Maamobi is experiencing a dual-burden of disease and disease risk depends on where people live.
Keywords: Slum, cluster analysis, vulnerability, slum vulnerability index, enumeration area, Ghana

Collins O. Airhihenbuwa (Penn State University, Pennsylvania), *"Why Culture Matters in Bridging Gaps in Health Inequity Globally."*
The global health priority to bridge gaps in health inequity continues to remain a major challenge. The burden of non-communicable diseases (NCDs) in the global south is outstripping infectious diseases, as tuberculosis, HIV and malaria co-exist with hypertension, diabetes and stroke. This interaction of infectious diseases and NCDs present a new challenge in bridging the widening inequity within and among nations. Culture is critical to understanding the intersection of these factors that influence decisions about health and behavior and the roles that 'agency' and 'resilience' play in framing solutions to equity in global health. Global health research that employs transdisciplinary approaches is pivotal to understanding health behaviors within the contexts of culture. This paper focuses on a ways in which the PEN-3 cultural model could offer possibilities for reframing solutions to global health inequity.
Keywords: Global Health, Culture, NCDs, infectious diseases, PEN-3 cultural model

Kilian Atuoye, Meghan McMorris, Roger Antabe, SieraVercillo, Joseph Kangmennaang, and Isaac Luginaah (Western University, Canada), *"Access to and Utilization of Skilled Birth Attendants in the Context of MDG 5 in Sub-Saharan Africa."*
Despite WHO's guidelines that indicate women should deliver with skilled birth attendants (SBA), many women in low and middle income countries deliver at home without the assistance of an SBA. This is because of several factors including severe shortages of SBAs and urban-rural distribution, with health centers in rural areas often understaffed, underserviced, and far removed from sparse populations, increasing pregnant women's difficulties in travelling to obtain SBA care. In this paper we examine and compare access to and utilization of SBA in the context of MDG 5 in 2003, 2008 and 2013 in Nigeria, and 2000, 2004 and 2010 in Malawi using DHS data sets. The findings will help illuminate our understanding of the progress being made in the use of SBAs as a vital determinant of maternal and newborn health outcomes.
Keywords: Maternal Health, Skill Birth Attendants, MDG 5, Sub-Saharan Africa

Martin Ayanore, Milena Pavlova, and Wim Groot (Maastricht University, The Netherlands), *"Focused Maternal Utilization Care in Ghana: Results of a Cluster Analysis."*
Ghana is likely to miss out in attaining MDG Goal 5 by 2015. The provision of adequate prenatal and postnatal care remains problematic. This paper examines focused maternal care utilization in Ghana. Two step cluster analysis automatically segregated women into groups based on WHO recommendation for focused care utilization. Using the cluster membership variables as dependent variables, we applied multinomial and binary regression to examine possible

associations of care use and individual, household and regional characteristics. We identified three patterns of care use: adequate, less and least adequate care use. The presence of female and skilled personnel was an indicator of better care. Women in Volta, Upper West, Northern and Western regions received less adequate care compared with other regions. Supply-related factors (drugs availability, distance/transport, health insurance ownership, rural residence) were associated with the type of care. Female autonomy, widowed/divorced women, age and parity were positively associated with less adequate care. In conclusion, the results indicate that care patterns were distinctively associated with the health support (skilled and female attendant) instead of with the number of visits made to the facility. Across regions and within rural settings, disparities exist, often compounded by supply-related factors. Efforts at addressing skilled workforce shortages, greater accountability for quality and equity, and those that improve women urgency, choices and active participation are important to improve maternity care in Ghana.

Keywords: maternal care, MDG 5, cluster analysis, Ghana

Njeri Bere (Lincoln Christian University, Illinois), *"Beyond Zero Campaign: Kenyan First Lady's initiative to save lives of mothers and children."*

Despite the strides Kenya has made in various social-economic fields, the country is listed amongst the ten most dangerous countries for pregnant women. This is because almost 8000 women die during childbirth every year. The Maternal Mortality Rates (MMR) in Kenya remains "unacceptably high at 488 maternal deaths per 100,000 live births (with some regions reporting MMRs of 1,000/100,000 live births) in 2008/9" (UNDP, 2014). Keeping in mind these dire statistics which indicate that Kenya has made little progress to achieve the commitment set in the Millennium Development Goals of 147 deaths per 100,000, in January 2014, the First Lady of Kenya, Margaret Kenyatta, started an initiative titled "Beyond Zero Campaign." The goal of this campaign was to raise awareness on the importance of maternal, newborn and children's health. Beyond merely raising awareness of these health problems, the campaign aimed to raise funds to purchase 47 mobile health clinics which were to be donated to each Kenyan county to meet the maternal needs of the less fortunate Kenyans. The motto of the Beyond Zero campaign was "No woman should die giving life." To galvanize support and mobilize resources to ensure no Kenyan woman died giving life, the Beyond Zero Campaign used various fund-raising strategies. The most remarkable one took place on April 13th 2014 when Mrs. Kenyatta ran the London marathon. This was a first for any First Lady! For her Beyond Zero Campaign initiative, Mrs. Kenyatta was voted by the United Nations in Kenya as the UN person of the year. In this paper, I discuss the various maternal and child health goals set out in the Beyond Zero Campaign, the fund raising strategies the campaign has used, and the progress it has made.

Keywords: maternal mortality, Beyond Zero Campaign, Kenya

Sarah R. Blackstone (University of Illinois Urbana-Champaign, Illinois), Ucheoma Nwaozuru, Juliet Iwelunmor. *Why are children dying in Nigeria: Evidence from the 2013 Demographic Health Survey*

Nigeria is the second largest contributor to child (under 5) mortality, with an average of 128 child deaths per 1,000 live births. One of the Millennium Development Goals regarding maternal and child health is to reduce childhood mortality rates to 64 per 1,000; however Nigeria is not on track to meet this target by the end of 2015. The present study explores the relationship between

maternal characteristics and likelihood of childhood mortality using the Nigeria Demographic and Health Survey (NDHS), 2013. Binary logistic regressions were conducted with childhood mortality (e.g. death before 59 months of age) as a dependent variable. Separate models were run for the first four reported births. Maternal characteristics investigated included age, education, region, whether antenatal care was received, timing of antenatal care, and whether the child was breastfed. Sex of the child was also adjusted for as a covariate. Maternal age and literacy was positively associated with likelihood of survival after 59 for birth 1. Number of children and family wealth were positively associated with survival likelihood for birth 1 and 3. Breastfeeding was positively associated with survival for birth, but negatively associated with survival for birth 2 and 3. The results point to some maternal characteristics that may be influential in childhood mortality. However, in order to reduce child mortality according to the MDG goals, community and systems level factors should be accounted for in interventions, as maternal characteristics do not offer a full explanation for why children are dying so young in Nigeria. ***Keywords***: childhood mortality, Demographic and Health Survey, Nigeria

Kwadwo Boakye, Joseph R. Oppong and Chetan Tiwari (University of North Texas, Texas), *"Emergency Response Services in Ghana: The Case of Kumasi."*

Comprehensive emergency management and response is crucial for disaster prevention and to mitigate casualties. Without this, developing countries face huge losses of lives and property, particularly in light of the surge in cardiovascular and obstetric emergencies. Surprisingly, little research exists on emergency response in African countries. This study examines the emergency response system to fire outbreaks in Kumasi, Ghana's second largest city. We use GIS tools including location-allocation modelling to evaluate the existing system of fire services, identify gaps in service, and suggest locations for new facilities. Our initial findings show that fire response time is severely hampered by poor coordination, equipment, and infrastructure, including frequent water shortages, and limited personnel. Currently Ghana lacks a comprehensive emergency response performance framework which includes a standard response time. Our results provide key insights for developing a comprehensive national emergency response system for Ghana and should be applicable to other African countries.
Keywords: Ghana, location allocation modelling, fire, emergency response system, Geographic Information Systems

Richard Bukenya (University of Illinois at Urbana Champaign, Illinois), Joyce Kinabo, Cornellio Nyaruhucha, Peter Mamiro and Juan Andrade, *"Assessment of nutrient adequacy of complementary foods for infants and young children in Magubike village, Morogoro region."*

Undernutrition is one of the leading causes of morbidity and mortality in infants and children under five years of age in Tanzania. One contributing factor to this issue is the inadequate supply of nutrients from complementary foods. This study aimed at assessing the nutrient intake from the prepared complementary foods provided to infants and children in Magubike village. A cross-sectional survey was used to collect nutritional information from the selected households. A total of 119 breastfeeding children with ages from 6-22 months participated. The dietary intakes were assessed using food frequency and 24-hour dietary intake questionnaires. Foods eaten by 27 randomly selected children were directly weighed from their households. Proximate analysis of carbohydrate, protein, fats, zinc, iron, and vitamin C were determined using standard AOAC methods. Duncan's multiple range tests were used to compare the means of nutrient content in food. Results showed 82% of the children below 12 months of age were breastfed

recommended times (at least eight times) within 24 hours. The frequency of feeding complementary foods ranged from 1 to 4 times each day. Maize porridge, the primary complementary food for most infants and children, contained (Per 100 g of wet sample) 51 kcal, 1.2 g protein, 0.2 g fat, 11.1 g carbohydrates, 0.54 mg iron, 0.1 mg of zinc and no vitamin C. Complementary foods provided 364 Kcal of for energy, 5g of fats or oils, 99%RDA of protein, 57%RDA of carbohydrates, 75%RDA for iron 21%RDA for zinc, and 5%RNI for vitamin C. The nutrient densities and feeding frequency of complementary meals was inadequate. Promotion of community food fortification programs would improve intake of the main micronutrients.
Keywords: Complementary foods, infants, children, dietary intake, Tanzania

Sandra Darfour-Oduro (University of Illinois at Urbana Champaign, Illinois) and Diana S. Grigsby-Toussaint, *"The Impact of Health Policies on Lifestyle Behaviors among Adolescent Girls in Sub-Saharan Africa."*
Recent projections from the World Health Organization (WHO) indicate that the prevalence of non-communicable diseases (NCDs) is increasing in sub-Saharan Africa. Although physical inactivity and low consumption of fruits and vegetables are known risk factors for NCDs, few studies have focused on NCD risk during adolescence. In this study we examine the impact of fruit and vegetable (FV) and physical activity (PA) policies on adequate fruit consumption (>=2 servings daily), vegetable consumption (>=3 servings daily), fruit and vegetable consumption (5 servings of 2 fruits & 3 vegetables) and physical activity behavior (60 minutes daily) among adolescent girls. Information on health policies was obtained from the WHO and from a systematic review of literature on health policies. Countries were selected for analysis based on availability of data from the Global School-Based Student Health Survey (GSHS). The total analytic sample was 22,916 adolescent girls from 13 countries. We found that adequate fruit consumption was highest among girls in Seychelles (59%). Using logistic regression models, we found a significant positive association between the presence of FV policy and adequate consumption of fruits {Adjusted Odds Ratio (AOR) = 1.54; 95%CI (1.44 – 1.64); p-value = 0.00} and adequate consumption of vegetables {AOR = 1.69; 95%CI (1.57 – 1.83); p-value = 0.00}. Additionally, the presence of PA policy was positively associated with adequate daily physical activity {AOR = 1.22; 95%CI (1.06 – 1.41); p-value = 0.00}. The presence of behavioral health policies in Sub-Saharan Africa provides a supportive environment for adolescent girls to consume adequate amounts of fruits and vegetables and to engage in adequate physical activity daily.
Keywords: Health policies, adolescent girls, lifestyle behaviors, Sub-Saharan Africa

Jenna Dixon, Susan J. Elliott and Elijah Bisung (University of Waterloo, Canada), *"Measuring what Matters: Toward a Global Index of Wellbeing."*
The 8 Millennium Development Goals have been touted as a milestone in global development efforts. Three of the final goals have been achieved prior to the deadline, but success is variable and significant gaps remain. A key issue related to documenting achievement is having clear operational definitions of ***success*** as well as accurate and valid measurement tools to discern real progress. For many years, developed countries have used GDP (Gross Domestic Product) as the key indicator of the economic health of a country. Since its inception, this measure has been known to be less than perfect but only recently have several countries launched "beyond GDP" initiatives; that is attempts to measure beyond economic health to some measure of happiness,

health, quality of life etc. While each of these has its own advantages and disadvantages, the Canadian Index of Wellbeing (CIW) has come to the fore as a useful model given its robustness and heavy reliance on secondary data (more widely accessible). Such an index can be useful in both assessing change over time *vis-à-vis* the wellbeing of a population, as well as change introduced through (policy) intervention. An interesting challenge is now to transpose this to LMICs (low to middle income countries) in order to track, in a systemic and rigorous fashion, to the MDGs and beyond. Kenya will be used as a proof of concept on the road toward a Global Index of Wellbeing. This case study was chosen given Kenya's position as both a leading and growing economy in LMICs. This paper begins with an overview of existing measures, assessing their robustness and application to an LMIC context. The proof of concept for Kenya is then developed. We conclude with next steps and policy implications out of this initiative.
Keywords: Index of well-being, low to middle income countries, Kenya

Ama Pokuaa Fenny (University of Ghana, Ghana), *"Live to 70 Years and over or Suffer In Silence: Understanding Health Insurance Status among the Elderly under the NHIS in Ghana."*

The exemption policy still remains central to the health system in Ghana even with the implementation of the National Health Insurance Scheme. One of the beneficiary groups of the exemption policy are the elderly, aged 70 years and above. There has been some debate why the start-off age for exemption among the elderly is 70 and not 60 years since Ghana like many other developing countries has a lower life expectancy and the age of retirement is 60 years. The objective of this study was to examine the determinants associated with health insurance status among two age cohorts (60-69 years and 70 years and above) and analyze the financial and social implication of charging premiums to the elderly aged 60-69 years. This is the first study that has tried to explore specifically the enrolment characteristics of these two age groups. Data came from a representative household survey, obtained from 3 selected districts from each of Ghana's 3 agro-ecological zones (coastal, forest and savannah). The sample comprised of 758 men and women aged 60-99 years. Descriptive statistics and logistic regression analysis were used to discover factors associated with health insurance ownership. The results indicate that being employed in the informal sector, having JSS/Middle school education or higher, were associated with having health insurance in the 60-69 year group. However, in both groups residing 2 to 5km from the nearest health facility was associated with having health insurance but yielded a lower likelihood in the 60-69 years group and a higher likelihood of having insurance in the 70+ year's group. Women residing in 60-69 group (OR = 2.6; p = 0.06) were more likely to be insured compared to women in the 70+ year group who were less likely to be insured (OR= 0.4; p = 0.01). The study concludes that Ghana continues to transform the NHIS into a program that will increase equity and access to health care services among most vulnerable groups. It is important that exemption policy is effectively implemented to include all vulnerable elderly persons to improve their ability to access good quality health care.
Keywords: Health insurance, Ghana, elderly

Jayati Ghosh, Rande Webster (Dominican University of California, California) and Ezekiel Kalipeni (University of Illinois at Urbana-Champaign, Illinois), *"HIV/AIDS Education in South African Schools: The Case of Youth Enrolled in a Township High School in the City of Port Elizabeth, South Africa."*

In 2000, 191 UN member states agreed to eight Millennium Development Goals (MDGs) one of which was to combat HIV/AIDS and other diseases, and one of the other was to eradicate poverty and hunger. However, the MDGs are recognized as being inter-dependent. For example the health of a community is impacted by the persistence of inequality and poverty, and access to education and health services. The region of Southern Africa continues to have the highest HIV infections of all the member states. Given the generally high HIV/AIDS rates among the youth in South Africa, particularly young pregnant females, this paper reports the results of a study that investigated the knowledge, attitudes and perceptions of high school youth about their HIV/AIDS concerns. One of the objectives was to examine gender differences in the knowledge and attitudes on HIV/AIDS among high school youth. The study was conducted in a secondary school located in a township in the Eastern Cape near the city of Port Elizabeth. Researchers collected data by surveying male and female youth enrolled in the school with the aim of gaining a better understanding of students' perception of their vulnerability to HIV/AIDS and to learn whether or not HIV/AIDS education has had an impact on their sexual behaviors. The results of the study indicate that there is growing awareness about HIV/AIDS particularly among male and female youth, living in impoverished neighborhoods such as the township school in which we conducted the study. The main policy implication of these results is that South Africa should aggressively continue to incorporate AIDS education in the school curriculum and actively engage the youth in HIV/AIDS prevention campaigns, particularly in schools that are located in poor neighborhoods. In the absence of aggressive HIV/AIDS education, South Africa will continue to lose crucial labor force and compromise the social structure which will ravage economic and social progress in the coming decades.

Keywords: HIV/AIDS, South Africa, Youth, Township High School, HIV /AIDS Education

Juliet Iwelunmor, Sarah Blackstone, Ezekiel Kalipeni (University of Illinois, Urbana Champaign, Illinois) Collins Airhihenbuwa, Gbenga Ogedegbe

Sustainability of health interventions in Africa: What is it and why does it matter?

For many decades, funders and implementers of health interventions have asked the question *"what happens among individuals, families, communities or health care systems when funding expires."* This question is especially pertinent for sub-Saharan Africa (SSA) where despite incredible gains in health achieved over the past 20 years (i.e. sharp declines in death among children under five), the continent continues to face a disproportionate share of the global disease burden. While sustainability is a desired outcome of effective implementation, there is neither research-based knowledge completed in this area nor is any "how to do it" empirical systematic review on sustainability in sub-Saharan Africa (SSA). Moreover, knowledge of the factors likely to influence sustainability of these interventions over time is largely unknown because of the complex nature of these interventions, the diversity of the implementation climate for different regions, and the cultural differences in various settings in which these public health interventions are implemented. The purpose of this systematic review is to examine the types and extent of sustainability with health interventions conducted in sub-Saharan Africa to date as well as summarize the findings on the factors that influenced the greater likelihood of sustainability. A total of 750 citations were identified and 30 met the search criteria. Findings highlight; a) the main health concerns in the target population; b) how sustainability was defined in health interventions conducted in sub-Saharan Africa including the measures used to examine the sustainability of these health interventions; c) the barriers and facilitators of sustainability; d) the context in which the intervention is delivered and its implications for sustainability; e) the

broader ecological factors influencing sustainability. Addressing the sustainability of health interventions could inform effective implementation, address funding policies and the overall efforts to reduce inequities while improving health in sub-Saharan Africa.
Keywords: Sustainability, health interventions, sub-Saharan Africa

Eliza Mary Johannes (IDA, Virginia), *"Kenya's Progress towards Millennium Development Goal Six: Incorporating the Turkana Nomads Living with HIV/AIDS into Kenya's Health Policy Framework of 2012-2030."*

Kenya is one of the 189 signatory countries to adopt the Millennium Development Goals (MDGs). The country committed itself to the health goals which carry the same MDGs fast track objective achievement by 2015. The health policy of 2012-2030 further provides the long term national development goals of attaining high health standards that are sensitive to the needs of the population. Yet Kenya is far from meeting the health Millennium Development Goal six namely: "Combat HIV/AIDS, Malaria, and other diseases," especially, pertaining to the nomadic populations residing in Turkana County. This paper will assess Kenya's progress towards the Millennium Development Goal six complemented by its health care policy framework of 2012-2030, and its applications to the nomadic population living with HIV/AIDS in Turkana County. Preliminary background research included extensive review of academic literature and government health care policies. This was followed by ethnographic field research, along with informal and semi-structured interviews conducted over a course of sixty days in Kenya, but more specifically Turkana County. The research used a snowball sampling method to identify potential subjects for the study. The snowball sampling technic was chosen due to the nature of the pastoral lifestyle of nomads, as well as the sensitive human-focus of the topic. The analyses contained in this paper notes that, despite Kenya's efforts to improve its overall status of health for its population, especially in reducing the number of people living with HIV/AIDS, the efforts fall short in ameliorating the condition of infection among the nomadic populations in Turkana County. According to reports Turkana County is among the top 10 of the regions infected by the disease in the country. Adult prevalence of HIV/AIDS is put at 7.5 percent in Turkana above the country's average of 6.0 percent. The central policy option here is for the Government of Kenya and international non-governmental organizations to invest heavily in both treatment and prevention in order to effectively manage the HIV/AIDS epidemic in the nomadic populations of Turkana County.
Keywords: HIV/AIDS, MDG 6, Kenya

Antar Jutla (West Virginia University, West Virginia), Thanh Huong Nguyen, Juliet Iwelunmor (University of Illinois at Urbana-Champaign, Illinois), *"Managing burden of diarrheal diseases in Sub-Saharan Africa."*

Millennium Development Goals have helped in cataloging data on water and sanitation, commonly referred to as WASH, in sub-Saharan Africa (SSA), but diarrheal diseases continue to present a significant public health burden. In fact, our recent analysis of WHO data suggests a steady increase in prevalence as well as geographical spread of diseases across Africa. Regions, where environmental processes intersect with societal norms and values, experience catastrophic outcome of disease outbreaks with high mortality rates. A recent outbreak of cholera in Zimbabwe in 2008 is one of the several examples that highlight the necessity of rethinking our approach to manage the burden of diarrheal diseases. Traditionally, vaccination is perhaps one the most sought out options to prevent an outbreak. With limited vaccines available for diarrheal

diseases, the key is to determine where and when to administer such preventive measures. Over last several decades, ideas on prediction of diarrheal diseases have gained momentum, but it remains ineffective due to inefficient interlinkages between environmental conditions favorable for growth of pathogens and interaction with human populations. We will present a new approach where a cascade of sequential models, at appropriate temporal and spatial scales, allows us to integrate large scale hydroclimatic processes with pathogens and finally to local population. This system dynamics based approach is likely to have both simulation and predictive capabilities, and hence may provide answers to questions such as where to provide vaccinations?; what should be WASH strategies in communities?; what are the conditions under which diarrheal diseases in a particular community should be managed without external factors? We will also present a perspective on how changing climate will likely affect emergence of diarrheal diseases in SSA.
Keywords: diarrheal diseases, system dynamics, water and sanitation, Sub-Saharan Africa

Ezekiel Kalipeni, Poonam Jusrut, Juliet Iwelunmor (University of Illinois at Urbana-Champaign, Illinois), ***"Assessing the Reduction of Infant Mortality Rates in Malawi Over the 1990-2010 Decades."***
One of the key objectives of the Millennium Development Goals was to improve the lives of infants and children, particularly the reduction of high infant and childhood mortality rates throughout the developing world. This paper examines the experiences of Malawi in tackling the problem of high infant and childhood mortality over recent decades, 1990-2010. We highlight the strategies that were used in Malawi which led to Malawi's stellar performance in achieving the targets set by the Millennium Development Goals with reference to infant and childhood mortality. The data for the analysis were obtained from Demographic and Health Surveys as well as the various censuses the country has conducted. Regression analysis using district as the unit of observation reveals several important factors that have led to the commendable declines in infant mortality. Significant factors included immunization of infants as well as increasing levels of female education and availability of skilled birth attendants. What Malawi's case demonstrates is that given a correct mix of strategies, even a poor country such as Malawi can meet some of the lofty targets set by the Millennium Development Goals.
Keywords: Millennium development goals, infant mortality rates, female education, Malawi

Joseph Kangmennaang, Kilian Atuoye, Meghan McMorris, Roger Antabe, Siera Vercillo and Isaac Luginaah (Western University, Canada), ***"Maternal health Care Service Utilization in Nigeria and Malawi in the Context of MDG 5."***
As the world draws curtains on the implementation of MDGs, there is increasing interest in evaluating the performance of countries on the goals and assessing related challenges and opportunities to inform the upcoming Sustainable Development Goals. While the literature on the improvement of maternal health (MDG 5) shows an improvement overall, 86% of the countries in sub-Saharan Africa still have high maternal mortality. This study examines changes in the utilization of maternal health care services in 2000, 2004 and 2010 in Malawi and 2003, 2008 and 2013 in Nigeria, using the urbanicity wealth index. Multivariate logistic regression models were fitted to demographic and health survey data sets to capture changes in maternal health care utilization. Our findings show that urbanicity wealth index was associated with the WHO's recommended four antenatal visits and timing of first antenatal care across the two countries. In Nigeria, rural poor women were 38% (OR=0.62, p=0.001) less likely to utilize the

recommended number of antenatal visits compared to urban poor women, however rural poor women were 46% (OR=1.46, p=0.001) more likely to have their first antenatal checkup within the first trimester compared to the urban poor. Comparing 2000 to 2010, women in Malawi were 40% (OR=0.60, p=0.001) less likely to attend the four recommended antenatal visits overall. These findings suggest that the sustainable development goals should incorporate both wealth and degrees of urbanicity to improve utilization of maternal health care services.
Keywords: Maternal health, Antenatal care, Sub-Saharan Africa, MDGs, urbanicity wealth index

Nanzen Caroline Kaphagawani (Malawi College of Health Sciences, Malawi), *"Factors contributing to teenage pregnancy in Zomba District, Malawi: The role of cultural beliefs, contraceptive use and knowledge on reproductive and sexual health."*

Teenage pregnancy is a health and social problem in Malawi as a result of physical, psychological and socio-economic consequences on the teenage mother, family and the society as a whole. The aim of this study was to explore risk factors associated with unplanned teenage pregnancy in Zomba District of Malawi. A cross-sectional analytic design was used. Data were obtained from 505 participants under the age of 20 years using a questionnaire administered through face-to-face interviews from five antenatal clinics. Descriptive statistics were used to analyze data and comparisons between planned and unplanned teenage pregnancy were conducted using the Chi-squared ($P \leq 0.05$) and logistic regression model to predict factors for unplanned pregnancy. Findings revealed that unplanned pregnancy accounted for 76.4% of teenagers attributable to early sex and marriage, low contraceptive use, educational levels and socio-economic status, lack of knowledge of reproductive and sexual health, substance abuse and gender inequalities, and physical/sexual violence. A multisectoral approach, including government, Non-Governmental Organizations (NGOs) and communities, is required to implement these recommendations.
Keywords: Unplanned/unwanted pregnancy, Teenage pregnancy, Teenagers, Adolescents, Malawi

Vincent Kuuire, Joseph Kangmennaang, Sheila Boamah, Kilian Atuoye, Isaac Luginaah (University of Western Ontario, Canada) and Eric Tenkorang (Memorial University of Newfoundland, Canada), "***Risk factors of infant and child mortality from 2000 - 2013 in Namibia and Mali."***

The UN indicates that in spite of substantial progress, the world is still falling short of the child mortality MDG target and preventable diseases have been identified as the most important cause of under-five deaths. Although under-five mortality rates have decreased globally, the rates in SSA remain alarmingly high. The evidence indicates that the rates in SSA are more than 7 times higher than Europe. Lack of improved sanitation and drinking water have been cited as the cause of many preventable diseases linked to child and infant mortality on the sub-continent. Sub-Saharan Africa's teeming population has some of the lowest access to improved water and sanitation facilities. In this study, we examine the nexus between under-five mortality and access to improved water and sanitation. Three rounds of cross-sectional DHS data from the two countries (Mali and Namibia) are pooled to create a pseudo-longitudinal data set. Survival analysis techniques are employed to examine the relationship between under-five mortality and water and sanitation controlling for year of survey. Results indicate sanitation as an important factor for both infant and child mortality in Mali and Namibia. In Namibia, households with

unimproved sanitation facilities have about 92% hazard rate of infant mortality and about 23% hazard rate of child mortality compared to those who have improved sanitation facilities. In Mali households with unimproved sanitation facilities have about 27% hazard rate of infant mortality and about 23% hazard rate of child mortality compared to those who have improved sanitation facilities. The results suggest that intra-country relative inequalities might be responsible for the differences observed in each country. The findings from this study reinforces need to address equity issues related to water and sanitation to help meet targets of reducing child and infant mortality in the post-MDG era.
Keywords: infant and child mortality, MDGs, demographic and health surveys, Namibia, Mali

Lucy Mkandawire-Valhmu (University of Wisconsin-Milwaukee, Wisconsin), "***Advancing the health of women and children in Southern Malawi through global partnerships: An analysis of one academic-community collaboration."***
As the time to revisit the Millennium Development Goals draws near, it is clear that the health and social problems that we continue to face are complex, requiring innovative and multifaceted interventions drawn from the expertise of interdisciplinary teams. Those of us who are experts on issues pertaining to health recognize that socio-political factors have an important bearing on health and that these factors need to be taken into account in order for health interventions to be effective. For the past several years, the College of Nursing at the University of Wisconsin-Milwaukee has established a global partnership with a number of Non-Governmental Organizations in Malawi, to promote the health and well-being of women and children living in Southern Malawi. This academic-community partnership is representative of an innovative strategy that translates the evidence generated by research scholars at an academic institution into interventions that are vetted and thereafter implemented by community-based organizations on the ground working directly with the people. Using the Millennium Development Goals as a framework along with a postcolonial feminist theoretical lens, we analyze the academic-community partnerships we have developed as an academic institution. We also explore how this partnership has helped to address the Millennium Development Goals that specifically pertain to advancing the health and well-being of women and children. In this paper, we detail the genesis of these global partnerships, what is involved in maintaining these relationships, the challenges involved in academic-community partnerships of this nature and most importantly how these partnerships serve to promote the health and well-being of communities of women and children in Malawi.
Keywords: Health, women and children, MDGs, Malawi

Imelda K. Moise, Moussa Ly (USAID funded MEASURE Evaluation and John Snow Inc.), Serge Bisore, Jean Pierre Rwantabagu, Florence Munezero (Bujumbura, Burundi), Asmini Hassan, LonginGashubije, Sublime Nkindiyabarimakurinda (Direction du Système National d' Information Sanitaire and Direction Générale de la Planification, Bujumbura, Burundi), "***A Partner Mapping Exercise to Inform Aid Coordination and Management for Health System Strengthening in Burundi."***
Burundi is one of the 60 countries globally that endorsed the 2005 Paris Declaration, which emphasized donor coordination and harmonization as important elements of aid effectiveness. Yet donor coordination with governments for management of national health management information systems (HMIS), a crucial infrastructure for coordination of healthcare interventions, is limited. The USAID-funded MEASURE Evaluation project conducted a mapping exercise

with 32 health partners (multilateral, bilateral, local, and international NGOs) and 44 health districts in Burundi. It aimed to identify who is doing what, where, and with whom at different healthcare levels; examine collaborative efforts among partners and the systems and tools used for management of health information; and investigate challenges and barriers that impede efforts to implementation of an HMIS and coordination of donor interventions. Although a high number of partners interviewed reported using information for decision making, no standardized tools are used across partners, parallel systems exists for data management and reporting, and integration of data systems is limited. Barriers to effective partner coordination and management include lack of government budget lines for HMIS activities; different partners' M&E needs, reporting deadlines, and performance-based financing requirements; lack of communication among partners and with the ministry of health; lack of organizational capacity and leadership--all of which affect HMIS data quality, use, and timely reporting. Results suggest that as a post-conflict country, Burundi is at an early stage in strengthening its HMIS and building aid coordination processes and efforts toward meeting Paris Declaration objectives. These mapping exercise results can be useful for informing and guiding the HMIS unit to better align and coordinate HMIS activities, support interventions, and identify gaps and overlaps in coverage of interventions – factors critical to ownership and sustainability of HMIS at the national level and in overcoming structural obstacles to achievement of aid effectiveness in Africa.
Keywords: Health management information systems, Paris Declaration, Burundi

John H. Muyonga (Makerere University, Uganda), ***"Can Return to Traditional African Foods Help Alleviate Malnutrition on the Continent of Africa?"***

Nutritional indicators for Africa remain alarming in spite of the positive trend in economic growth on the continent. Under-nutrition, iron deficiency anemia and vitamin A deficiency are the most significant nutritional problems among nutritionally vulnerable groups, particularly under-fives and among women of child bearing age. Under-nutrition and nutritional deficiencies are the main underlying causes of morbidity and mortality. Approximately 50% of deaths are among under-fives while anemia is highly linked to poor pregnancy outcomes. The high morbidity and fatality rate among HIV infected persons is also highly associated to malnutrition. Over-nutrition and associated health problems including diabetes and coronary heart diseases have in recent decades emerged as major problems in Africa. A number of traditional African foods have been shown to contain high levels of essential nutrients as well as phytochemicals known to positively impact on health. Native fruits and vegetables, including African black olive (*Canariumsweinfurthii*), pomegranate, guava, java plum (*Syzygiumcumini*), sweet banana, tamarind, mango, passion fruits, *Ipomeaeriocarpa, Corchorustrilocularis, Corchorusspp, Acalyphabipartita* and *Hibiscus acetosella*have been reported to exhibit significant levels of antioxidant activity while native mushrooms have been shown in animal studies to lower serum low density lipoproteins. Small fish species traditionally consumed in many parts of Africa are high in vitamin A, calcium and polyunsaturated omega 3 fatty acids. It is well established that bioactive compounds including carotenoids, tocopherols flavonoids, terpenoids, isoflavones, tocotrienols, allyl sulfur compounds, and omega-3 PUFA contained in some foods are associated with antioxidant, anticancer, anti-diabetic and hypocholesterolemic properties. Promotion of the production and utilization of these foods will be explored as a strategy for alleviation of nutritional problems and associated health cases.
Keywords: malnutrition, traditional foods, Sub-Saharan Africa

James M. Ntambi (University of Wisconsin-Madison, Wisconsin), Diana Grigsby-Toussaint (University of Illinois at Urbana Champaign) *"The Dual Burden of Diseases in Sub-Saharan Africa."*

Developing countries experience the dual burden of epidemic levels of infectious disease and at the same time an increased prevalence of non-communicable diseases (NCDs) or metabolic syndrome diseases such as obesity, type 2 diabetes, hypertension, heart disease and fatty liver disease. The double burden of diseases is impeding human development in Sub-Saharan Africa by its negative impact on education, income and life expectancy and other health indicators. The meager financial resources and overstretched skilled human resources are unable to effectively combat the disease burden. Emphasis must, therefore, be placed on the preventive aspects of these diseases. Fortunately, many of the aspects of the NCDs are preventable. Both early detection and management of these diseases also help to mitigate the costly chronic complications and premature mortality. Similarly, the impact of communicable diseases can be alleviated by efficient strategies, including affordability of treatments, development of new vaccines and medicines, improvement of environmental conditions and general incentives and sensitization of the population. Finally there is a need to initiate training focusing on basic laboratory research relevant to local health and biomedical problems, including issues of both under- and over-nutrition, referred to as "The Double Burden". State of the art basic science research in these areas, including epigenetics, genomics, and proteomics,remain as a major weakness in Sub-Saharan Africa.

Keywords: dual burden of non-communicable and infectious diseases, prevention, Sub-Saharan Africa

Ucheoma Nwaozuru, Sarah R. Blackstone and Juliet Iwelunmor (University of Illinois Urbana-Champaign, Illinois), *"Perceptions of Childhood Malaria and Care-seeking Practices among Nigerian Mothers."*

In Nigeria, an estimated 150 million people are at risk of infection with malaria parasites. Malaria is also consistently recorded as one of the leading causes of mortality in children under 5. Prompt and accurate diagnosis of childhood malaria has been emphasized throughout the literature as an important factor in reducing mortality in children, yet there are many barriers to prompt and accurate diagnosis of the disease in children. Understanding the individual, socio-cultural, and structural factors that influence risk is necessary with efforts aimed at preventing malaria in children. This study utilized data from an in-depth interview with mothers of 135 febrile children attending an outpatient clinic in Lagos of Southwest Nigeria. Children were examined by physicians who diagnosed the illness in question. Cross-tabulations were conducted to determine concordance between physician diagnosis of malaria and mothers' perceptions of the child's illness. The results indicate that 119 of 135 children were diagnosed as having malaria by a physician. 16 were diagnosed with another illness or with no illness. Only 35 out of 119 children diagnosed with malaria by a physician were correctly diagnosed by their mothers ($\chi^2 = 136.4$, $p < .001$). 18 of the 119 children diagnosed by a physician with malaria were reported by their mothers to have diarrhea ($\chi^2 = 4.83$, $p < .05$). In conclusion, Nigeria still remains in the control phase of malaria. In order to move on to the pre-elimination and elimination phases of the disease, our findings highlight the need to account for individual, socio-cultural and structural factors that influence perceptions and understanding of malaria in children.

Keywords: childhood malaria, care-seeking practices, Nigeria

Hanson Nyantakyi-Frimpong (The University of Western Ontario, Canada) and Rachel Bezner Kerr (Cornell University, New York), *"Health, food security and nutrition in Africa and the Post-2015 MDGs: Lessons from Ghana and Malawi."*

Africa is among the world regions that will not meet most of the Millennium Development Goals (MDGs) by the 2015 target date. Across the continent, health-related MDGs are lagging, especially in countries facing multiple vulnerabilities from HIV/AIDS, climate change and land degradation. In many countries, food insecurity, malnutrition and poor health continue to remain critical challenges. Most of these challenges are being addressed through the promotion of intensive farming methods, using high-input seeds, fertilizers and other technological solutions. While these strategies can maximize productivity in the short term, studies have shown that they are ecologically unsustainable, increasingly unaffordable and do not address entrenched social inequalities in the food system. Despite more than a decade of active promotion of input intensification, Africa is off-track in meeting the MDGs related to nutritional security, suggesting that alternative approaches are urgently needed. The purpose of this paper is to inform critical debates on what to do differently in Africa, and where governments, non-governmental organizations, and international institutions should direct their investments in a post-2015 development agenda. Drawing upon comparative case studies from Ghana and Malawi, we discuss how food and nutritional security could be improved through diversified farming systems. Our analysis also considers the importance of gender relations and land struggles, and how these intersect in complex ways to shape dietary diversity and nutritional security. We argue that nutritional security – achieved through sustainable farming methods – is crucial in order to achieve many of the MDGs, including those on education, health and gender inequality. A poorly nourished population cannot resist infectious diseases, and nutrition plays a crucial role in mitigating the impacts of HIV/AIDS among affected households. Good nutrition also reduces mortality among mothers and children. Although our findings are specific to Ghana and Malawi, we outline crosscutting lessons that are relevant for the broader African context.

Keywords: Nutrition, HIV/AIDS, MDGs, Ghana, Malawi

Charles Nzioka (University of Nairobi, Kenya), *"Dealing with Challenges of Health and Community Systems Strengthening in Response to HIV and AIDS in Kenya."*

Statistics show that between 2007 and 2012, new HIV infections among adults in Kenya declined by 11%, from 95,000 to 85,000 and among children by nearly 44%, from 23,000 to 13,000. Despite this, HIV still accounts for 29.3% of all deaths and 24.2% of all ill health in the country. The objective of this paper is to examine Kenya government's efforts to reduce HIV rates in an attempt to achieve the MDG, including major investments in health and community health systems strengthening in a devolved government system. A mixed method approach has been used with most of the quantitative data being drawn from national and county health sector policy documents and additional qualitative data from key informant interviews. The paper finds that despite these significant reductions in HIV infection rates, Kenya's health care system is still characterised by inadequate and unevenly distributed health personnel both within the sector and across the country; low morale; poor leadership; inadequate financing; weak governance systems and lack of accountability and these factor undermine its effective response to HIV and AIDS. Linkages, referrals, collaboration and coordination between and across the national and county governments as well as public and private sector health systems also remain weak and uncoordinated.In line with the MDGs and other international covenants, Kenya remains

committed to be an AIDS free society. The country has invested enormous amounts of efforts and resources to strengthen its health and community health system in response to HIV and other diseases. However, more investments and concerted efforts are still need for a sustained and equitable services delivery.
Keywords: HIV, AIDS, Health, Community, system strengthening, Kenya

Julia Nonyerem Ogwunga (Alvan Ikoku Federal College of Education, Nigeria), ***"Recommendations and Future Directions for the Millennium Developmental Goals: Mental Health a Must Inclusion – Spotlighting Nigeria."***
Research findings document that mental health is a crucial public health and developmental issue in Sub-Saharan Africa (SSA) and there is a strong relationship between mental health and all the dimensions of the Millennium Developmental Goals. Also documented are findings that there has been challenges in the SSA countries like Nigeria towards achieving the MDGs. It is a fact that the MDGs completely ignore mental health disorders which are documented to be amongst the most important causes of sickness, disability and premature deaths in Africa. In Nigeria there is little or no mental health provisions in secondary schools, when it is known that the child's ability to learn is significantly affected by his/her mental health. Only 3% of the Federal Health Budget goes to mental health, in a country where about 28 million people suffer form of mental disorder and less than 10% receive any form of treatment, mainly out of pocket expenditure; whereas treatment for pregnant women is free in some states, which has brought about some reduction in maternal mortality; where about 35% of schools attending adolescents in one metropolitan city were screened to have depressive disorders and 99% had adverse childhood experiences; and where the prevalence of post-natal depression is 18.6%. There can be no sustainable development without addressing the issue of mental health which is under prioritized in countries like Nigeria. It is recommended that mental health be integrated into the next phase of the MDGs for the reasons that the MDGs draw up agenda issues that are prioritized and endorsed by the world's governments as being urgent and requiring definite resource commitments. There is need to also go beyond policy making, to enforce – mental health budget standards, government subsidy on treatment, rehabilitation for the mentally challenged, and implement the Mental Health Gap Action Program.
Keywords: mental health, MDGs, Nigeria

Chinelo C. Okigbo (University of North Carolina at Chapel Hill, North Carolina), Korede K. Adegoke (University of South Florida, Florida) and Comfort Z. Olorunsaiye (University of North Carolina at Charlotte, North Carolina), ***"Assessing Reproductive Health Indicators in Nigeria from 1990-2013."***
Maternal mortality is a global public health issue, with sub-Saharan Africa bearing a greater proportion of the burden. Nigeria is the second largest contributor to the global maternal mortality ratio (MMR). The targets of the fifth Millennium Development Goal (MDG5: Improve Maternal Health) are to: decrease by 75% the 1990 MMR and achieve universal access to reproductive health (RH) by 2015. The RH targets in the National Policy on Population for Sustainable Development (NPPSD) in Nigeria are to: reduce population growth rate to ≤2% by 2015; decrease MMR to 75 per 100,000 live births by 2015; and increase modern contraceptive prevalence by 2% points annually. With the deadline in sight, this study aims to assess the progress Nigeria has made in improving access to maternal health services in the last two decades. We examine the trends in three RH indicators (contraceptive prevalence rate, skilled

birth attendance, and adolescent birth) from 1990 to 2013 using five available Nigeria Demographic and Health Surveys (NDHS). NDHS is a cross-sectional household survey with a multi-stage probability sampling design. Trend and regression analyses were conducted. Our results show increasing trends in modern contraceptive prevalence rate from 3.8% in 1990 to 11.1% in 2013 (p=0.046) and in skilled birth attendance from 30.8% in 1990 to 40% in 2013 (p=0.98). We found a decreasing trend in adolescent birth rate from 23.5% in 1990 to 17.1% in 2013 (p=0.43). There are marked disparities in the indicators based on residence, wealth, and educational attainment with the rural residents, the very poor, and the less educated bearing the greatest burden. Our results indicate that Nigeria is not on track to achieve both the MDG5 and NPPSD targets by 2015. Concerted efforts should focus on vulnerable populations to improve maternal health in Nigeria. ***Keywords***: MDG 5, maternal mortality, Nigeria

Joseph R. Oppong (University of North Texas, Texas) and Tschakert Petra (Pennsylvania State University, Pennsylvania), *"Vulnerable People, Vulnerable Places and Buruli Ulcer in Ghana."*

Vulnerability to disease is inevitably tied to specific places and people. Consequently, the most vulnerable population bears the brunt of the burden of communicable diseases. Such people usually live in areas that are least able to resist diseases; areas that attract more of such vulnerable people. Moreover, by creating an environment of heightened vulnerability, such places increase the risk of disease for all who live there. This paper examines this hypothesis in the context of Buruli Ulcer in Ghana where global gold prices have led to the proliferation of small scale, and frequently, illegal gold mining using dangerous practices. Buruli Ulcer outbreaks in Ghana appear to follow these activities, but the disease usually affects the most vulnerable population – children and the poor. Using field data from ongoing field work in Ghana, we explore this hypothesis.

Keywords: vulnerable populations, communicable diseases, Ghana

Joseph R. Oppong, Emmanuel Aggrey-Korsah (University of North Texas, Texas), Adobea Yaa Owusu (University of Ghana, Ghana) and Regina Edziyie (Kwame Nkrumah University of Science and Technology, Ghana), *"Unravelling Ghana's Market Fires – A Gendered and Structural Analysis."*

Market fires are a huge challenge in Ghana's major cities. Due to their dominance in retail trade, women bear the brunt of the fire losses leaving a clear gendered nature of market fire losses. Unfortunately, for small scale and women owned enterprises, fire insurance is rare. Driven by politics, the heated discussions of Ghana's frequent fires have focused on finger pointing and blame apportioning, rather than the role of fire services facilities, their number, location, staffing, equipment and ability to cover potential fire outbreaks. This is the gap we seek to fill. We undertook a content survey of the leading Ghanaian newspapers and collected data from the Ghana Fire Service to understand the geography of fire outbreaks in Accra, Ghana's largest city. We also examined the configuration of fire service facilities, equipment, and staffing to determine gaps in service coverage using simple GIS analysis. The results suggest that systemic and structural issues including poor code enforcement, irregular water supply, overcrowded markets and poorly located and equipped fire services are important drivers of Ghana's market fires. Improving fire service coverage through addressing the structural problems is an urgent necessity for Ghana's hardworking market women and bread winners.

Keywords: Ghana, market fires, GIS, gender, Accra

John Oryema and Gabriel Picone (University of South Florida, Florida), *"The Impact of Debt Relief on Child Mortality."*

This study investigates the impact of highly indebted poor countries initiative (HIPC) and Multilateral Debt Relief Initiative (MDRI) on under 5 child mortality rate in Sub Saharan Africa (SSA). HIPC and MDRI were part of international commitment in helping developing countries accelerate progress towards achievement of Millennium Development Goals (MDGs). Under the initiatives developing countries with substantial external debt burden were required to come up with Poverty Reduction Strategies Papers (PRSP) indicating increased budget allocation towards poverty reduction and the MDGs. After meeting the required completion points for necessary reforms, the HIPC countries would then qualify for complete cancelation of their external debt. Overall 33 countries in SSA benefited from HIPC, while another 14 countries never benefited from HIPC. Moreover, there is a large variation on the timing and intensity of this debt relief. We use this variation to identify the effects of HIPC on child mortality. Funds that used to service external debt would be channeled towards social services such as health and education. The expected health outcome includes reduction in child mortality and improvement in maternal healthcare, among others. The data used in the study is World Development Indicators (2013) from 1998 to 2012. IMFs annual reports on the HIPC were used to extract the actual amount of debt forgiven. The WHO Global Health Observatory Data Repository is the data source for under 5 child mortality rate. Fixed effects (FE) and dynamic panel data approaches were applied to estimate the impact of debt relief on under 5 child mortality rate. We find that HIPC reduces child mortality and the effects are important. We conclude that debt relief had a significant impact on reduction of child mortality in SSA and hence contributed towards the achievement of one of the MDGs. ***Key words***: debt relief, child mortality, highly indebted poor countries, Sub-Saharan Africa

Afolabi Oyapero and B. O. Ogunbanjo (Lagos State University Teaching Hospital, Nigeria), *"Maternal Perception about Early Childhood Caries at the Lagos State University Teaching Hospital."*

Maternal attitude towards oral health has been linked to the oral health status of children. Very little consideration has been given to the effects of preexisting parental attitudes, knowledge and behavior on outcomes in early childhood caries in very young children. The aim of this study was to determine the maternal knowledge, attitude and practices on early childhood caries and to assess its relationship with socio-demographic variables among mothers at the immunization clinic of the Lagos State University Teaching Hospital, Ikeja (LASUTH). This cross-sectional study was conducted at the immunization clinic of LASUTH on mothers with babies aged 3-12 months attending the clinic. An interviewer administered questionnaire was employed and a total of 144 respondents were interviewed. Seventy three percent of the population was in the 26-35 age category while 73.8% worked full time. Majority of the respondents (56.9%) had tertiary education. The mothers revealed a low level of awareness in 1 out of the 12 items included in the knowledge and attitude section of the questionnaire. They had moderate awareness on 7 of the items while they had high perception on 4 items. Tertiary educated respondents had significantly better responses in most of the aspects tested. They however had poor practices with regards to exposure of their infants to cariogenic bacteria and cariogenic diet. About 88% have regular oral contact with their babies' mouth while 84.7% chew and soften meals for their babies. An attempt should be made to bridge the gap between maternal knowledge/attitude and their practices with regards to the oral health of their children. Aggressive health promotion activities should be

targeted at mothers and would be mothers at ante- and post-natal clinics as well as in paediatric out patients and the general community.
Keywords: dental caries, oral health, Nigeria

Natasha Oyibo, John Watt, and Gordon Weller (Middlesex University, London, UK), ***"Risk communication as a strategy for tackling maternal mortality in Nigeria."***
Approximately two thirds of all the women in Nigeria, and three quarters of rural Nigerian women, deliver their babies outside of health facilities and without medically skilled attendants present. Maternal mortality is therefore one of the major challenges in reproductive health in Nigeria, which is yet to meet the United Nations Millennium Development Goal (MDG5). Communication and education are clearly vital since so many births take place outside formal healthcare environments and the current high mortality rate suggests that there is potential for real progress, which can supplement Nigerian government efforts to increase resources. The purpose of the study was to compare expert and lay knowledge and interpretations about the important components of the problem as part of a wider mental models study aimed at improving risk communication. An expert mental model has been constructed by extensive literature review and consultation with experts from academia, non-governmental agencies and hospital consultants. This model was used for preliminary evaluation of the extent and accuracy of lay perceptions among the target group. These perceptions were elicited through semi-structured interviews with women of childbearing age (15-49) in Rivers State located in the southern region of Nigeria. Interviews were transcribed and analysed to evaluate common themes that will be used to model lay perceptions for comparison to the expert mental model. The emergent themes are presented and discussed in the context of the identification of important gaps in knowledge and misperceptions that have the potential for development of improved risk communication. Results are also presented from a structured questionnaire that was subsequently given to a wider target group of women to assess the extent to which these key information gaps and misconceptions are prevalent. Future work includes the development and evaluation of risk communication protocols to address them.
Keywords: Africa, MDG5, socio-cultural, perception, misconceptions

Gabriel Picone (University of South Florida, Florida), ***"Determinants and Prevention of Low Birth Weight in sub-Saharan Africa: The Effects of Bed Net Distribution."***
Since 2000, a large-scale international effort to eradicate malaria, particularly through the distribution of insecticide-treated bed nets, has achieved a substantial reduction in malaria incidence and mortality. The effect of malaria, however, extends far beyond the direct measures of fatalities and disease prevalence. Specifically, malaria infection in pregnancy is associated with high risk of low birth weight. Conventionally defined as a birth weight less than 2500 grams (5.5 pounds), low birth weight is associated with greater risk of significant health and developmental difficulties which may impose a large economic burden on society. To further investigate the economic impact of malaria interventions, this paper focuses on birth weight, the primary measure of infant health and welfare in economic research. Using the data from the Demographic and Health Surveys for 209 regions in 18 countries from 1999 to 2014, this paper implements a difference-in-differences identification strategy to exploit the geographic and time variation in the rollout of bed nets in order to estimate the causal effect of bed net usage, bed net ownership and insecticide-treated bed net usage on birth weight in sub-Saharan Africa. Our results suggest a positive relationship between bed net distribution and birth weight. These

findings have important policy implications and advance specific recommendations for the post-2015 Development Agenda. Malaria control programs need to take special measures to focus on pregnant women, one of the population groups at considerably high risk of contracting malaria and developing severe disease, to reduce low birth weight incidence in sub-Saharan Africa.
Keywords: low birth weight, malaria, bed nets, Sub-Saharan Africa

Warangkana Ruckthongsook and Joseph R. Oppong (University of North Texas, Texas), *"The Impact of Land Use and Land Cover Change on the Spatial Distribution of Buruli Ulcer in Southwest Ghana."*

Buruli ulcer (BU), a disease caused by *Mycobacterium ulcerans*, occurs predominantly in tropical environments. Modes of transmission and hosts of disease remain unknown, but environmental factors are being investigated to determine the possible location(s) of host of the disease. In this study, we use satellite image and spatial analyses to determine environmental risk factors; then use a Poisson regression to explore how land use and land cover change impact the spatial distribution of BU in southwest Ghana. The results show that BU rates are positively correlated to closed-forest and inversely correlated to grass land, soil, and urban areas. This indicates that forest is the most important environmental risk factor in this study. The Zero-inflated Poisson regression model shows that the changes of land use and land cover affect the spatial distribution of BU. However, the model over-estimates the BU cases. Thus, while closed-forest is the most important land use that predicts BU, other factors such as human activities should be included in order to generate a more precise prediction model.
Keywords: Buruli ulcer, spatial distribution, land use and land cover change, Poisson regression, Ghana

Jude Saji, Felix K. Assah, Emmanuella N. Atanga, Jean Claude Mbanya (Health of Population in Transition, Yaounde, Cameroon), *"Weight Status Changes and Uncontrolled Urbanization in Cameroon: Current and Future Health Challenges."*

Once perceived as a problem exclusively affecting the affluent, excess weight is fast becoming a major issue of concern for all population segments in Cameroon just like in other developing countries. Morbidity and mortality from obesity-related pathologies such as diabetes and heart disease are now almost as prevalent as from infections. The situation is expected to worsen over the coming years, influenced by the simultaneous rapid urbanization and changing lifestyle. Physical inactivity and unhealthy diets-especially among urban populations translate into larger waistlines for Cameroonians of all age groups. Physical activity is an effective strategy to curb the rising rates of obesity and related health effects. However, maintaining an active lifestyle is often hindered by multiple factors, one of which is the proliferation of urban slums in most cities with limited environment-related opportunities and motivation for outdoor physical activity. Children fail to understand the benefits of being physically active and exercise insufficiently as many schools are constructed without provision for playgrounds. With Non Communicable Diseases (NCDs) having been omitted from the Millennium Development Goals (MDGs), it appears that progress in terms of environmental and health policy targeting these conditions has been relatively slower. The negative consequences of this situation are already evident in terms of increased strain on the economies and health systems of developing countries. There is therefore a dire need for the post-2015 development agenda to include a component targeting the prevention and management of NCDs and related risks, with particular focus on curbing the obesity pandemic. This article reviews the pattern of weight status and related risks over time

among Cameroonians, possible reasons for the current state of affairs, as well as likely future trends. It particularly explores the role of uncontrolled urbanization in driving the current trend as well as potential intervention opportunities for public health workers.
Keywords: weight status, NCDs, MDGs, urbanization, Cameroon

Linda L. Semu (McDaniel College, Maryland), *"Perilous Outcomes: The Intersection of Culture, Maternal Health (Mortality and Morbidity) and HIV/AIDS on Malawian Women in the Face of an International Development Consensus."*
The Millennium Development Goals (MDGs) are wide-reaching, covering women's practical and strategic needs. Operating on a global consensus that has galvanized resources and efforts, perhaps no other region has stood to benefit the most than sub-Saharan Africa due to its high rates of: poverty, illiteracy, child and maternal mortality, and HIV/AIDS. This paper attempts to address the question of whether an international development consensus is sufficient to overcome the impact of culture on the status of Malawian women. While it provides an overview of the state of Malawian women related to the eight MDGs, quantitative and qualitative assessments of secondary national data are used to focus the paper on maternal health, HIV/AIDS and gender inequality. It argues that maternal mortality, morbidity and HIV/AIDS are indicative of systemic and interlocking processes that are related to poverty, gender discrimination, and gender-based violence. Furthermore, cultural norms that perpetuate gender inequality are regularly produced and reproduced through the sanctioning of norms, behaviors and practices that reinforce women's subordinate position that result in inter-related HIV/AIDS and maternal health outcomes. Hence, hunger and poor nutrition, ill health, lack of sexual and reproductive health services, and exposure to gender-based violence are related to high risk, early onset, frequent and unwanted pregnancies and childbearing. In addition, low educational attainment, illiteracy, poverty, little or no access to, and control over resources, and lack of autonomy exacerbate gender inequalities. Granted, the goals set by MDGs are practical benchmarks that have the potential to propel Africa's growth and development. The paper uses the Malawi case study to argue that moving forward into the post-2015 MDGs, it is only through a holistic approach that encompasses broad sexual and reproductive health, while cognizant of systemic cultural and gender processes, and also incorporates all the other MDGs that transformative growth and development will occur.
Keywords: HIV/AIDS, culture, health, Malawi

Alexandra Shapiro, Jenna Bryfonski, Anna Hoefler (Colgate University, New York) and Ezekiel Kalipeni, (University of Illinois at Urbana-Champaign, Illinois), *"Examining the West African Ebola Outbreak through the Application of the Disease Ecology Framework."*
This paper employs the disease ecology framework as a platform for understanding the factors that led to the Ebola outbreak starting in February of 2014 in West Africa. The paper outlines a political background to provide the historical context of the three most severely affected countries: Guinea, Liberia, and Sierra Leone. With an overview of the historical context, considering Ebola through a disease ecology lens highlights various aspects of human activity that explain potential avenues by which Ebola entered the human population. Additionally, historical context can lend insight into which activities may have fueled this Ebola outbreak to become a global epidemic. The three main categories that form the vertices of the triangle of human ecology of disease are population, the habitat, and behavior of the affected region. Some key human activities this paper identifies and examines within these three categories are political

instability, the mining industry, deforestation and climate change and the cultural context. The paper concludes by offering a set of proposed policy options which are informed by the identified human activities revealed through the use and analysis of the disease ecology framework. It is our conviction that the highlighted policy implications and options can and should be able to assist in combating and controlling Ebola outbreaks.
Keywords: Ebola, triangle of human ecology of disease, population, habitat, culture, Guinea, Liberia, Sierra Leone

Yewande Sofolahan-Oladeinde (University of Maryland-Baltimore, Maryland) Donaldson F. Conserve (University of North Carolina at Chapel Hill, North Carolina), and Juliet Iwelunmor (University of Illinois at Urbana-Champaign, Illinois), ***"Exploring the Cultural Context of Managing HIV Serodiscordance in Intimate and Reproductive Relationships among Women Living with HIV/AIDS in Southwest Nigeria."***
According to the World Health Organization, 50% of HIV-positive people in on-going relationships are in serodiscordant relationships (i.e. they have an HIV-negative partner). Prior to the advent of effective antiretroviral treatment and preventive strategies such as prevention of mother-to-child transmission, treatment-as-prevention, and pre-exposure prophylaxis, being diagnosed with HIV was seen as a 'death sentence'. These advances in therapeutic and preventive measures ensure that many HIV-positive people live longer and healthier lives. The implication of this is that many HIV-positive people wish to engage in long-term intimate and reproductive relationships, since getting married and having children are considered cultural expectations in the African context. This study draws upon semi-structured interviews with women living with HIV/AIDS (WLHA) in Nigeria to investigate the cultural dynamics of their experiences with serodiscordant heterosexual relationships in relation to HIV risk perceptions and their childbearing decisions. Interviews were conducted between June-August of 2011 with 60 WLHA who received HIV care at a Lagos hospital and who had access to antiretroviral drugs. Of these 60 women, 35 were married or engaged, 19 of whom had an HIV-negative partner, while three were unaware of their partner's status. Among those that reported having a boyfriend or being in a casual relationship, five had HIV-negative partners, and 11 were unaware of their partner's status. Participants reported HIV serodiscordance as being "confusing," due to the multiple explanations of serodiscordance and being unable to comprehend how one partner could remain negative in an intimate relationship with a positive partner. Their understanding of serodiscordance was juxtaposed against their spiritual beliefs. We present three case studies that exemplify different ways of managing serodiscordance in intimate relationships with regards to childbearing and sexual health decisions. These examples suggest that people have multiple explanations of serodiscordance shaped by different sociocultural factors, and HIV programs should offer biomedical explanations about HIV serodiscordance to affected couples.
Keywords: HIV/AIDS, serodiscordance, relationships, Nigeria

Soazic Elise Wang Sonne and Eleonora Nillesen (United Nations University-Maastricht, The Netherlands), ***"Long-term Effects of Violent Conflict on Second-generation Health Outcomes: Evidence from Liberia."***
A recent body of literature has investigated the consequences of conflict on health outcomes and generally finds a negative impact of exposure to conflict on various health indicators. This paper aims to examine the long-term effects of households' exposure to the 1989-2003 Liberian civil war on second-generation children's anthropometric outcomes, born after the war. We use

village-level data on violent attacks and detailed information about the household's migration history to accurately measure exposure to violence during war. Results are robust to including co-variates, village, and birth cohort fixed effects. By exploiting geographical and temporal variation, we find a significant and negative effect of the residency in conflict affected areas combined with the number of years at least one parent (the household head) spent under the war when attending primary school, on children short term health outcomes (measured by the Weight for Height Z score).
Keywords: WHZ, children's health, conflict, Liberia

Bamidele Tayo (Loyola University, Stritch School of Medicine), Freddy Zizi, Helen Cole, Girardin Jean-Louis, Albert Amoah, Richard Adanu, Gbenga Ogedegbe. ***A Novel Training Model to Build Capacity in Cardiovascular Health Research in Sub-Saharan Africa: Experience from the CaRT Institute.*** Cardiovascular disease (CVD) is the leading cause of death in Africa, accounting for an estimated 80% of the mortality and morbidity. In Sub-Saharan Africa (SSA), the incidence of hypertension, diabetes and stroke-related mortality has increased tremendously in the past decade. Thus, building capacity in cardiovascular risk reduction in SSA is a priority that is both critical and urgent. The Fogarty-funded Cardiovascular Research Training (CaRT) Institute is a collaborative training program between New York University School of Medicine, Loyola University School of Medicine and the University of Ghana. The CaRT Institute is geared towards developing junior faculty, postgraduate physicians, and matriculated MPH/PhD graduate students as independent investigators. The long-term training model requires mentees to attend the program for a period of two years with the first year spent attending intensive research courses that expose them to various types of research including fundamentals of research methodology, health services research, comparative effectiveness research, and dissemination and implementation research. During the second year, mentees spend their time in various career development and mentorship activities, and in honing their acquired research skills in the development and implementation of individual research projects, manuscripts development and grant applications. To date, 64 scholars (38 males, 26 females) have been matriculated and completed the CaRT program. The breakdown by degrees was as follow: MBCHB (n=17), MBBS (n=13), PhD (n=7), DDS (n=2), MD, MD/MPH (n=4) MBCHB, MBBS/MPH and other master level degrees (n=13), an 8 had missing data. Since the inception of the program three years ago, CaRT scholars have published over 25 manuscripts, 7 book chapters, and 36 scientific abstracts in conference proceedings. In addition, 4 CaRT scholars have received funding for their work. It is evident that the institute addresses a critical deficiency in the number of African Scholars committed to research careers in cardiovascular medicine, and provides all mentees with a broad foundation of knowledge and research skills upon which to establish their careers. The long-term goal of the CaRT Institute is to produce a sustainable network of individuals who are exceedingly well trained in various aspects of cardiovascular research, and poised to assume leadership roles in academic cardiovascular medicine in Ghana, Nigeria and SSA. ***Keywords*****:** CVD, training, capacity building, Sub-Saharan Africa

Eric Y. Tenkorang (Memorial University of Newfoundland, Canada) and Vincent Z. Kuuire (University of Western Ontario, Canada), ***"Non-communicable Diseases in Ghana: Does the Theory of Social Gradient in Health Hold?"***
The theory of the social gradient in health posits that individuals with lower socio-economic status have the poorest health outcomes, compared to those in higher socio-economic brackets. Applied to non-communicable diseases (NCDs), this theory has largely been corroborated by

studies from the West, but evidence from sub-Saharan Africa are mixed and those from Ghana conspicuously missing in the literature. Using data from the Study on Global Ageing and Adult Health (SAGE) and applying random-effects C log-log models, this study examined the relationship between SES and the risks of NCDs in Ghana. Results confirmed the negative social gradient as Ghanaians with higher SES and those living in urban areas were more likely to have an NCD than those with low SES and residing in rural areas. Lifestyle factors partially account for the risks of NCDs among wealthier men, and educated and wealthier women. This study underscores the need for policies targeted at specific socio-economic and demographic groups such as the emerging middle and upper class Ghanaians. It is similarly important for interventions to move beyond biomedical discourses that put a lot more emphasis on epidemiological risk factors to ones that embrace psycho-social factors as important correlates of cardiovascular health.
Keywords: Ghana, Non-communicable diseases, urbanization, Social gradient, health

Eric Y. Tenkorang, Emmanuel Banchani (Memorial University of Newfoundland, Canada), Vincent Kuuire and Isaac Luginaah (Western University, Canada), *"Hypertension in Ghana: Prevalence and Risk Factors."*
Like most countries in sub-Saharan Africa, hypertension contributes substantially to morbidity and mortality in Ghana, yet nationally representative studies that examine the risks of becoming hypertensive in Ghana are conspicuously missing. We fill this void in the literature. Data used came from the first wave of the Study on Global Ageing and Adult Survey (SAGE) collected in Ghana from January 2007 to December 2008 by the World Health Organization. A total of 5573 respondents were sampled for the study. Random-effects C-log log models were employed in examining socio-economic, lifestyle and psychosocial factors on the risks of becoming hypertensive in Ghana. Separate models were run for male and females. Results indicate strong significant associations between socio-economic, lifestyle and psychosocial factors on the likelihood of becoming hypertensive among Ghanaian men and women. Compared with the poorest, wealthy Ghanaians are significantly more likely to be hypertensive. Educated women, compared with the uneducated are also more likely to be hypertensive. Ghanaians who engage in vigorous-intensive activities for at least 10 minutes continuously are significantly less likely to be hypertensive compared to those who do not. While happier men had reduced risks of becoming hypertensive, depressed women had increased risks of reporting they were hypertensive. This study highlights the need for policy makers to adopt a holistic policy towards curbing the rates of hypertension in Ghana-one that considers lifestyle changes among the wealthy and promotes the psycho-social health of the Ghanaian people in general.
Keywords: Ghana, hypertension, non-communicable diseases, wealth, risk factors.

Odujoko Tolulope, Idris Oladipo, Ojomu Funke, Adedokun Ayoade (Lagos State University Teaching Hospital, Nigeria), *"The Effect of Spirituality on Medication Adherence among Hypertensive Patients at a Nigerian Teaching Hospital."*
Sub-Saharan Africa is battling with the double burden of non-communicable diseases and the yet unresolved communicable diseases. Hypertension is a leading cause of morbidity and mortality in the region. The problem is aggravated by poor levels of medication adherence which is pivotal in patient outcomes. Strategies to improve adherence to medications are critical in the reduction of the incidence of uncontrolled and complicated hypertension. Exploring the dimensions of patients' spirituality has become a veritable strategy in partnering with patients to improve

adherence and treatment outcomes. There is a paucity of research investigating the impact of spirituality on health outcomes in this environment. Using a combination of interviewer-administered questionnaires, this cross-sectional study explored the intensity/centrality of spirituality using the Brief Multidimensional Measure of Religiousness/ Spirituality and its effect on medication adherence levels in hypertensive patients. A total of 240 participants were recruited. A total of 237 respondents completed the study (67.10% females). Respondents' age ranged from 30-95 (57.41±10.90) years. The intensity/ centrality of spirituality was moderate in 79.95% of the participants while 69.20% had low levels of medication adherence. A weak positive correlation was found between medication adherence and intensity/ centrality of spirituality (r=0.1). However, the association between spirituality and medication adherence was not statistically significant (P>0.05). At the sub-levels of the domains, only Commitment had a statistically significant relationship with medication adherence [P = 0.001]. In conclusion, low levels of medication adherence and moderate levels of spirituality were observed in most of the study population. The overall level of spirituality was not found to have any association with medication adherence. However, at the domain sub-levels of spirituality, commitment was found to have a positive association with medication adherence. More studies need to be conducted to establish the association between spirituality and medication adherence in this practice setting.
Keywords: medical adherence, spirituality, hypertension, Nigeria

Elizabeth Wachira (Texas Woman's University, Texas) and Joseph R. Oppong (University of North Texas, Texas), ***"A Political Ecology of Africa's Brain Drain Crisis."***
Emigration of trained health workers from African countries is a serious problem that threatens a health care crisis in the most seriously affected countries. Sadly, the countries with the most critical need for health workers are the ones most likely to lose health workers to more developed countries. This paper examines Africa's brain drain crisis, focusing on the migration of health care workers in Ghana, Nigeria, Sierra Leone, Zimbabwe and South Africa. Using a political ecology approach, we interrogate the underlying push and pull factors. The results implicate political, social and economic factors at the local and global level. It concludes that given the difficult economic challenges of these African countries, without urgent and effective intervention, the health worker brain drain problem will continue to get worse and will compound Africa's health problems. The research explores policy options and recommendations to manage and mitigate the negative impacts of Africa's brain drain crisis.
Keywords: Brain drain, health workers, Ghana, Nigeria, Sierra Leone, Zimbabwe, South Africa

Rande Webster, Jayati Ghosh (Dominican University of California, California) and Ezekiel Kalipeni (University of Illinois at Urbana-Champaign, Illinois), ***"Role of Education in Combating HIV/AIDS Crisis in South Africa: A Study of Youth and Teachers in the Eastern Cape City of Port Elizabeth."***
HIV prevalence among youth continues to be high in sub-Saharan African countries. South Africa has been delivering HIV/AIDS education through the Life Orientation curriculum. We wanted to gain understanding of whether or not HIV/AIDS education has had an impact on students' knowledge about HIV and sexual behavior. We conducted focus-group interviews of male and female youth and teachers enrolled in two high schools in the Eastern Cape in the city of Port Elizabeth. Interviews were intentionally segregated by gender to encourage candid discussions on sexual behavior. One of the schools was located in a township in South Africa, while the other was located in a higher socio-economic area of the city. Twenty male and

twenty-three female youth participated in four focus group discussions. In addition, eighteen teachers from the same schools were interviewed. These focus group discussions from over 60 participants were recorded, transcribed, and analyzed to determine major themes. In this paper we selected three questions and analyzed the data. Results of the focus group interviews between the two schools clearly illustrate the growing knowledge about HIV and methods for protection from getting infected with this virus. Students articulated the negative impacts of HIV on communities and themselves and were able to provide possible strategies to reduce HIV prevalence in South Africa. The discussions from the teacher focus groups showed stark differences in the responses between those teaching in the township school compared with those teaching in the higher socio-economic neighborhood. The results illustrate the effectiveness of school based life skills education as well as the discrepancies in knowledge and perceptions based on economic and social conditions. Given the inter-dependency between health, gender differences, and poverty, it is paramount that South Africa continues to take an active role in incorporating AIDS education in the school curriculum and engaging the youth and teachers more in HIV/AIDS prevention campaigns in order to forge a path toward economic growth and development.

Keywords: HIV/AIDS, South Africa, Male and Female Youth, Teachers, High School, HIV/AIDS Education

Guy-Lucien S. Whembolua, Koffi N. Maglo (University of Cincinnati, Ohio), Daudet Ilunga Tshiswaka (University of Illinois at Urbana-Champaign, Illinois), Donaldson Conserve, Muswamba Mwamba (University of North Carolina at Chapel Hill, North Carolina), DarlyKambamba (University of Kinshasa, Democratic Republic of the Congo),
"Conspiracy Theories and Global Bioethics: The Case of the 2014 Ebola Outbreak."

Since March of 2014, the Ebola Virus Disease (EVD) has swept across Western Africa, killing more than 2600 people as of late September. EVD has been reported in Liberia, Nigeria, Guinea, Sierra Leone, and Senegal with over 40% of the cases occurring in the past few weeks. On March 21st, 2014, the outbreak was first reported and has since proven to be the largest EVD outbreak yet with a case fatality of 64%. While no treatment has been officially approved yet, media reports indicate that those suffering with symptoms in Africa have received supportive care when they could reach a health facility; several Westerners have received experimental treatment once arrived in their respective countries. The purpose of this study is (a) to evaluate the role played by several conspiracy theories in the spread of EVD as narrated in Western media, and (b) to evaluate the ethics in experimental medicine as it relates to this outbreak. Several conspiracy theories were analyzed and identified as barriers to improvement of care for EVD patients. Ethically, the EVD outbreak highlighted the broader issue of global inequity as well as the scarce resources for research on tropical diseases available on the continent of Africa. A clear understanding of the psychological perspective of Africans could serve health education programs designed to promote the containment of EVD among continental Africans and African immigrants populations living abroad.

Keywords: Global bioethics, Ebola, media, Liberia, Nigeria, Guinea, Sierra Leone, Senegal

Assata Zerai (University of Illinois at Urbana-Champaign, Illinois), ***"Hypermasculinity, State Violence, and MDG Shortfalls: Water, Sanitation, and Child Morbidity in Zimbabwe."***

In this manuscript, I explore child morbidity in Zimbabwe from an Africana feminist sociological perspective. I present a framework that considers the ways in which neocolonial

relations, ethnicity, class, gender, globalization, and other dimensions of oppression intersect to impact upon the accomplishment of Millennium Development Goals in regards to hunger, environmental sustainability, and child health in Zimbabwe. I analyze 1988, 1994, 1999, 2005-06, and 2010-11 data from the Demographic and Health Surveys for this country. On the basis of the Africana feminist framework elaborated herein, I argue that early childhood morbidity cannot be understood unless the socioeconomic, political, and cultural contexts are taken into account. I extend and test the hypothesis that militarism (especially state violence) and hyper-masculinity in Zimbabwe have deleterious effects on safe water and sanitation, family well-being in general, and especially on child health. Utilizing logistic regression analysis and by testing statistical interactions, I find that safe water and sanitation are in short supply and further, that the mal-distribution of development resources has a deleterious impact on early childhood nutrition. This work contributes importantly to the social scientific literature in the social demography of Africa because it adapts the vibrant intellectual work of Africana feminists to a quantitative methodology. Thus the work proposes a new Africana feminist quantitative methodology that could be utilized to study other subject matter. Further, on the basis of this novel methodological approach, this work elicits results that give rise to useful maternal and child health-related policy recommendations that may inform future discussions and revisions of Millennium Development Goals.

Keywords: ethnic divisions, maternal and child health, Africa, Zimbabwe, feminist analysis, Millennium Development Goals, water and sanitation, environmental sustainability, child morbidity

Leo Zulu, Ashton Shortridge (Michigan State University, Michigan), Imelda Moise (John Snow Inc, Virginia), and Ezekiel Kalipeni (University of Illinois at Urbana-Champaign, Illinois) ***"Generating District Level Estimates of HIV Prevalence Using GIS: A Comparative Analysis of Antenatal Clinic Surveillance Data and Demographic and Health Survey Data for Malawi, 1994-2010."***

Over the past decade, the international landscape for modeling HIV prevalence and generating estimates in developing countries has changed dramatically. As finer grained survey-based data that include HIV prevalence and potential drivers, including Demographic and Health Surveys (DHS) data, become more available especially among sub-Saharan Africa countries, global efforts turn to the search for smarter and more effective targeting of interventions to consolidate gains and finally turn the tide in the fight against the epidemic. These factors challenge relevant multiple disciplines to develop methods for generation of reliable estimates of the prevalence and burden of HIV/AIDS at the finest and policy-relevant sub-national levels. Although many scholars have so far concentrated on statistical models to generate prevalence estimates for HIV rates, health geographers increasingly explore the use of Geographic Information Systems (GIS) and spatial-statistical analysis to contribute to understanding and addressing this highly spatialized pandemic. Building on initial work we have done on Malawi, we explore the potential of using GIS and spatial analysis tools to generate finer sub-national estimates of HIV prevalence. Initial analysis suggests that although DHS data offer higher spatial resolution data from more representative population-based samples than previous estimates based on data from pregnant women attending antenatal clinics (ANCs), 'noise' in the spatial structure of some DHS data can limit our ability to take full advantage of the higher-resolution data using geospatial methods. We use ANC and DHS data to generate HIV prevalence estimates for Malawi, assess drivers of observed patters at district, and sub-district levels for the years

2003/2004 and 2010 to identify relative strengths, challenges including spatially explicit uncertainty patterns, and opportunities or synergies. The analysis will also assist in spatial targeting based on clustering and drivers analyses. The study also identifies a suitable spatial interpolation method for the HIV estimates for summarization at policy-appropriate geographic scales. The accuracy of the models will be assessed by iterative cross-validation of predicted and observed values using the software package R.
Keywords: HIV/AIDS, prevalence, surveillance, Zimbabwe

PARTICIPANT LIST

Vissého Adjiwanou
Centre for Actuarial Research (CARe)
University of Cape Town
Private Bag Rondebosch
7701 South Africa
Email: visseho09@yahoo.fr

Emmanuel Aggrey-Korsah
Department of Geography
University of North Texas
1155 Union Circle #305279
Denton, TX 76203-5017
Email: hkwesi@live.com

Collins O. Airhihenbuwa
Department of Biobehavioral Health
The Pennsylvania State University
University Park, PA 16802
Email: aou@psu.edu

Roger Antabe
Department of Geography
Western University
1151 Richmond Street
London, Ontario
Canada, N6A 3K7
Email: rantabe@uwo.ca

Kilian Atuoye
Department of Geography
Western University
1151 Richmond Street
London, Ontario
Canada, N6A 3K7
Email: katuoye@uwo.ca

Martin Ayanore
Health Services Reaserch (HSR)
Maastricht University
Duboisdomein 30 Room 0.066
P.O. Box 616, 6200 MD Maastricht
The Netherlands
Email: m.ayanore@maastrichtuniversity.nl

Njeri Bere
Lincoln Christian University
100 Campus View Drive
Lincoln, IL 62656
Email: nbere@lincolnchristian.edu

Kwadwo Boakye
Department of Geography
University of North Texas
1155 Union Circle #305279
Denton, TX 76203-5017
Email: KwadwoBoakye@my.unt.edu

Jenna Bryfonski
Department of Geography
216 Ho Science Center
Colgate University, Hamilton, NY 13346
Email: jbryfonski@colgate.edu

Sandra Asantewaa Darfour-Oduro
Dept of Kinesiology & Community Health
1206 South Fourth Street
323 Armory, 1206 S Fourth, M/C 588
Champaign, IL 61820
Email: darfrdr2@illinois.edu

Jenna Dixon
University of Waterloo
Faculty of Applied Health Sciences
School of Public Health & Health
Systems-General, LHI South 1616
200 University Avenue West
Waterloo, ON, Canada N2L 3G1
Email: jenna.dixon@uwaterloo.ca

Donaldson F. Conserve
University of North Carolina at Chapel Hill
Gillings School of Global Public Health
302 Rosenau Hall, CB #7400
Chapel Hill, NC 27599‑7400
Email: dxg341@gmail.com

Mosoka P. Fallah
Head of Case Detection
Montserrado Incident Management System
Ministry of Health and Social Welfare
Republic of Liberia
Email: mfallah1969@gmail.com

Ama Pokuaa Fenny
Institute of Statistical
Social and Economic Research (ISSER)
University of Ghana, P. O. Box LG74
Legon-Accra, Ghana
Email: amafenny@yahoo.co.uk

Bizu Gelaye
Department of Epidemiology
Harvard T. H. Chan School of Public Health
677 Huntington Ave., Room 501
Boston, MA 02115
Email: bgelaye@hsph.harvard.edu

Jayati Ghosh
Dominican University of California
50 Acacia Avenue
San Rafael, CA 94901
Email: jayati.ghosh@dominican.edu

Diana Grigsby-Toussaint
University of Illinois at Urbana-Champaign
& Harvard Medical School
2019 Huff Hall, 1206 South Fourth Street
Champaign, IL, 61820
Phone:(217)333-9207
Email: dgrigs1@illinois.edu;
d.grigs@northeastern.edu;
Diana_grigsby-toussaint@hms.harvard.edu

Anne Hoefler
Department of Geography
216 Ho Science Center
Colgate University
Hamilton, NY 13346
Email: ahoefler@colgate.edu

Juliet Iwelunmor
Dept of Kinesiology and Community Health
University of Illinois at Urbana-Champaign
123 Huff Hall, 1206 S. Fourth Street
Champaign, IL, 61820
Phone: (217) 333-2307
E-mail: jiwez@illinois.edu

Eliza M. Johannes
IDA Headquarters
4850 Mark Center Drive
Alexandria, VA 22311-1882
Email: eliza.johannes@gmail.com
or ejohanne@ida.org

Poonam Jusrut
Department of Geography & GIScience
University of Illinois at Urbana-Champaign
255 Computing Applications Building
605 East Springfield, Champaign, IL 61820
Email: poonamjusrut@gmail.com

Antar Jutla
Dept. of Civil and Environmental Engineering
West Virginia University
Morgantown, WV 26508
Email: asjutla@mail.wvu.edu

Ezekiel Kalipeni
Department of Geography &GIScience
University of Illinois at Urbana-Champaign
245 Computing Applications Building
605 East Springfield, Champaign, IL 61820
Phone: (217) 244-7708
Email: kalipeni@illinois.edu

Joseph Kangmennaang
Department of Geography
Western University
1151 Richmond Street
London, Ontario, Canada, N6A 3K7
Email: jkangmen@uwo.ca

Nanzen Kaphagawani
Nursing Department
North West University
Mafikeng Campus, Pvt/Bag X2046
Mmabatho 2735, South Africa
Email: nanzenkaphagawani@yahoo.co.uk

Isaac Luginaah
Department of Geography
Western University
1151 Richmond Street
London, Ontario, Canada, N6A 3K7
Email: iluginaa@uwo.ca

Megan McMorris
Department of Geography
Western University
1151 Richmond Street
London, Ontario, Canada, N6A 3K7
Email: mmcmorri@uwo.ca

Lucy Mkandawire-Valhmu
University of Wisconsin-Milwaukee
College of Nursing
P.O. Box 415, Milwaukee
Wisconsin 53201
Email: mkandawi@uwm.edu

Imelda Moise
John Snow Inc., 1616 N Fort Myer Dr
Arlington, VA 22099
Email: imeldamoise@yahoo.com

John H. Muyonga
School of Food Technology
Nutrition & Bioengineering
Makerere University, Kampala, Uganda
Email: hmuyonga@yahoo.com

Thanh Huong Nguyen
3230 Newmark Lab
Civil & Environmental Engineering, MC 250
205 N Mathews, Urbana, IL 61801
Email: thn@illinois.edu

James M. Ntambi
Dept of Biochemistry and of Nutritional Sciences
University of Wisconsin-Madison
Madison WI 53706
Email: ntambi@biochem.wisc.edu

Hanson Nyantakyi-Frimpong
Department of Geography
Western University
London, ON, N6A5C2, Canada
Email: hnyantak@uwo.ca

Charles Bonasera Kyalo Nzioka
Department of Sociology
University of Nairobi
P.O. Box 30197 – 00100 GPO
Nairobi, Kenya
Email: cnzioka@uonbi.ac.ke

Julia Nonyerem Ogwunga
Department of Health Services
Alvan Ikoku Federal College of Education
Owerri, PMB 1033
Owerri Imo State, Nigeria
Email: julianonyeremogwunga@yahoo.com

Ucheoma Nwaozuru
Dept of Kinesiology and Community Health
College of Applied Health Sciences
2019 Huff Hall, 1206 South Fourth Street
Champaign, IL, 61820
Email: nwaozur2@illinois.edu

Chinelo C. Okigbo
Department of Maternal and Child Health
Gillings School of Global Public Health
University of North Carolina at Chapel Hill
135 Dauer Drive, 401 Rosenau Hall
CB #7445, Chapel Hill, NC 27599-7445
Email: cokigbo@live.unc.edu

Joseph R. Oppong
Department of Geography
University of North Texas
Denton, TX 76203-5017
Email: joseph.oppong@unt.edu

John Oryema
Department of Economics
University of South Florida
Tampa, FL 33620, United States
Email: jboryema@mail.usf.edu

Afolabi Oyapero
Department of Preventive Dentistry
Lagos State University Teaching Hospital
Ikeja, Lagos, Nigeria
Email: fola_ba@yahoo.com

Oyejoke Oyapero
Department of Paediatrics
Alimosho-Igando General Hospital
Lagos State, Nigeria
Email: fola_ba@yahoo.com

Natasha Oyibo
Centre for Decision Analysis and Risk Management
School of Science and Technology
Middlesex University, The Burroughs
Hendon, NW4 4BT, London
United Kingdom
Email: NO251@live.mdx.ac.uk

Gabriel Picone
Department of Economics
University of South Florida
Tampa, FL 33620
Email: gpicone@usf.edu

Charles N. Rotimi
Metabolic, Cardiovascular, and
Inflammatory Disease Genomics
Branch & Center for Research on
Genomics and Global Health
National Institutes of Health
Building 12A, Room 4047
12 South Drive, Bethesda, MD 20892
Email: rotimic@mail.nih.gov

Warangkana Ruckthongsook
Department of Geography
University of North Texas
1155 Union Circle #305279
Denton, TX 76203-5017
E: WarangkanaRuckthongsook@my.unt.edu

Linda Semu
McDaniel College, 2 College Hill
Westminster, MD 21157
Email: lsemu@mcdaniel.edu

Alexandra Shapiro
Department of Geography
216 Ho Science Center
Colgate University, Hamilton, NY 13346
Email: afshapiro@colgate.edu

Yewande Sofolahan-Oladeinde
Pharmaceutical Health Services Research Dept
University of Maryland School of Pharmacy
220 Arch Street, 12th Floor Room 01-510
Baltimore, MD 21201
Email: yoladeinde@rx.umaryland.edu

Soazic Elise Wang Sonne
United Nations University
Maastricht Economics and Social Research
Institute on Innovation and Technology
Keizer Karelplein 19
6211 TC Maastricht, The Netherlands
Email: wangsonne@merit.unu.edu

Bamidele Tayo
Stritch School of Medicine
2160 South First Avenue
Loyola University
Maywood, IL 60153
Email: btayo@luc.edu

Eric Y. Tenkorang
Department of Sociology
Memorial University
St. John's, NL, A1C 5S7
Canada
Email: eytenkorang@mun.ca

Odujoko Tolulope
Department of Family Medicine
Lagos State University
Teaching Hospital (LASUTH)
Ikeja, Lagos, Nigeria
E-mail: toluodujoko@gmail.com

Daudet Ilunga Tshiswaka
Department of Kinesiology and Community
Health, College of Applied Health Sciences
2019 Huff Hall, 1206 South Fourth Street
Champaign, IL, 61820
Email: ilungat1@illinois.edu

SieraVercillo
Department of Geography
Western University
1151 Richmond Street
London, Ontario
Canada, N6A 3K7
Email: svercill@uwo.ca

Elizabeth Wachira
Department of Health Studies
Texas Woman's University
P. O. Box 425499
Denton, Texas 76204
Email: elizabethwachira@gmail.com

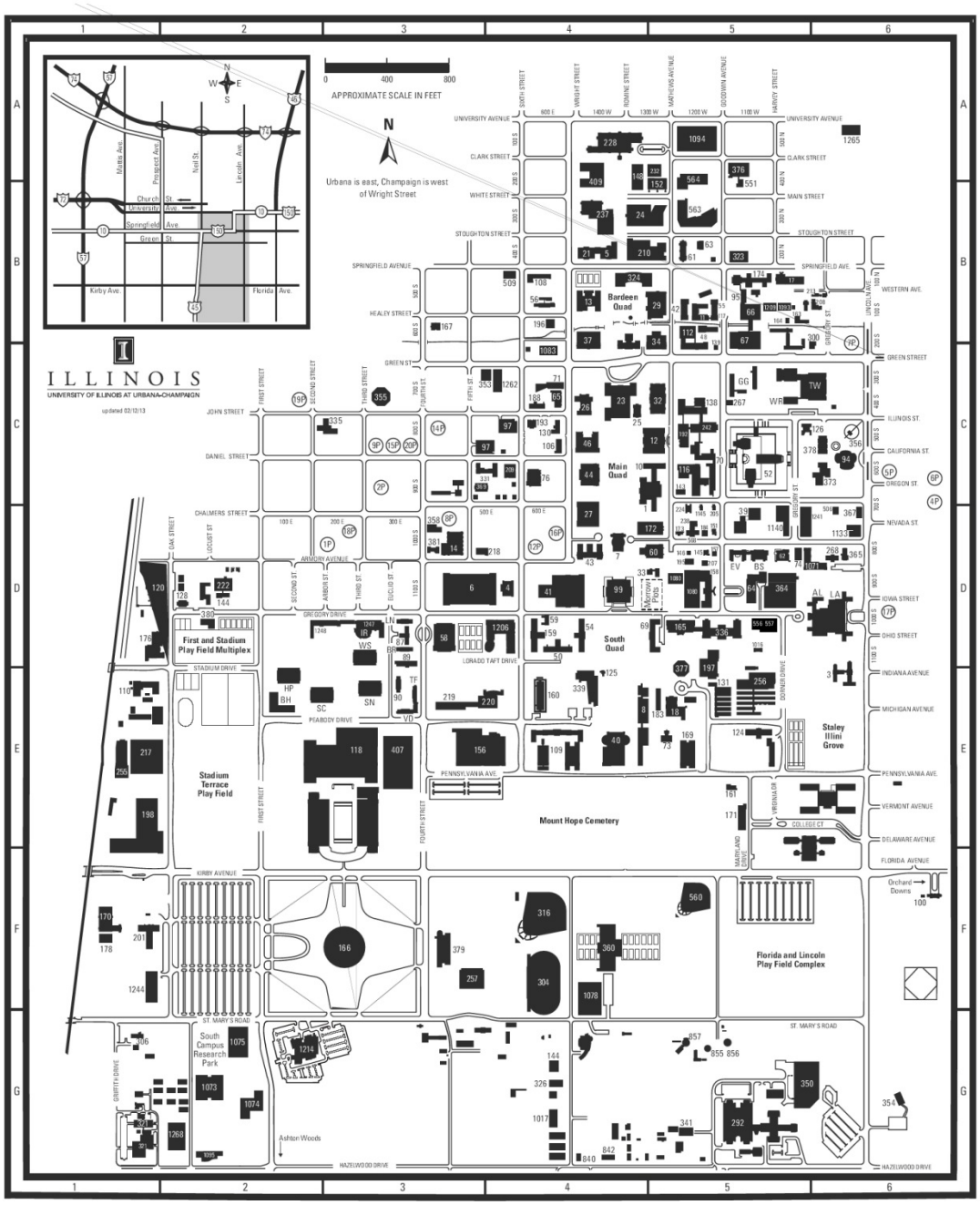
Rande Webster
Dominican University of California
50 Acacia Avenue
San Rafael, California 94901
Email: rande.webster@dominican.edu

Guy-Lucien S. Whembolua
Department of Africana Studies
French Hall 3605 West
Cincinnati, Ohio 45221-0370
Email: gl.whembolua@uc.edu

Assata Zerai
Sociology Department
Lincoln Hall 3120
University of Illinois at Urbana-Champaign
702 South Wright Street, M/C 454
Urbana, IL 61801
Email: azerai@illinois.edu

MAPS OF THE UNIVERSITY OF ILLINOIS ATURBANA-CHAMPAIGN AND LOCATION OF HAWTHORN SUITES HOTEL

MAP 1: UNIVERSITY OF ILLINOIS



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Key is on following page

Key for Map 1

Campus Map

The designation in parentheses (D1) indicates the map coordinates.

#	Building Name (Map Coordinates)
	A
120	Abbott Power Plant (D1)
377	ACES Library & Info Center (E5)
118	Activities and Recreation Cntr (E2)
378	Admissions and Records (C6)
17	Advanced Computation Bldg (B5)
1093	Aerodynamics Research Lab (B5)
28	Aeronautical Lab A (B5)
157	Afro-Amer Studies & Rsch Prog (D5)
73	Agricultural Bioprocess Lab (E5)
8	Ag Engineering Sci Bldg (E4)
326	Agriculture Services Bldg (G4)
329	Ag Services Warehouse (G4)
824	Agronomy/Plant Path Farm (G4)
842	Agronomy Seed House (G4)
991	Agronomy Soybean Rsch Farm (G5)
94	Alice Campbell Alumni Center (C6)
26	Altgeld Hall (C4)
831	Animal Science Barns (G3)
165	Animal Sciences Lab (D5)
374	Arboretum Hartley Gardens (F6)
50	Architecture Bldg (D4)
6	Armory (D3)
219	Art & Design Bldg (E3)
18	Art E Annex, Studio 1 (E5)
2	Art E Annex, Studio 2 (E5)
1145	Asian American House (C5)
568	Asian American Studies Bldg (D5)
300	Astronomy Bldg (B5)
1075	Atkins Bldg (G2)
360	Atkins Tennis Ctr (F4)
208	Atmospheric Sciences Bldg (B6)
107	Atmospheric Sciences Annex 1 (B5)
139	Atmospheric Sciences Annex 2 (B5)
	B
228	Beckman Institute (A4)
335	Beckwith Hall (C2)
158	Bevier Hall (D5)
379	Bielfeldt Athletic Admin Bldg (F3)
307	Biological Control Lab (G1)
306	Building Research Council (G1)
169	Burnsides Rsch Lab (E5)
138	Burrill Hall (C5)
	Business Instructional Facility see C 1206
	C
	Campbell Alumni Center see A 94
376	Campbell Hall for Public Telecommunications (A5)
364	Campus Recreation Ctr East (D5)
380	Campus Rec Outdoor Ctr (D2)
71	Career Center (C4)
285	Center for Advanced Study (C6)
170	Central Receiving Bldg (F1)
55	Ceramics Bldg (B5)
11	Ceramics Kiln House (C5)
70	Chemical & Life Sci Lab (C5)
10	Chemistry Annex (C5)
1213	Chesterbrook Academy (H2)
62	Child Development Lab A (D5)
87	Clark Hall Housing Admin (D3)
130	Coble Hall (C4)
1206	College of Business Instructional Facility (D4)
167	Colonel Wolfe School (B3)
108	Computing Applications Bldg (B4)
148	Coordinated Science Lab (A4)
	D
855-857	Dairy Exper Round Barns (G5)
365	Dance Admin Bldg (D6)
268	Dance Studio (D6)
1	Davenport Hall (C5)
54	David Kinley Hall (D4)
1187	Demirjian Golf Practice Facility (G4)
210	Digital Computer Lab (B4)
1133	Doris Kelley Christopher Hall (D6)
144	Duplicating/Quick Copy Bldg (G4)
	E
1071	Early Child Development Lab (D5)
1140	Gregory Place I (C5)
160	Education Bldg (E4)
560	Eichelberger Field (F5)
409	Electrical and Computer Engineering Bldg (A4)
15	Engineering Hall (B4)
162	Engineering Sr Design Studio (B6)
174	Engineering Sciences Bldg (B5)
1209	Engineering Student Project Lab (B5)
44	English Bldg (C4)
1095	Enterprise Works (G2)
213	Environmental Health & Safety (B6)
107	Environmental Rsrch Annex (B5)
37	Everitt Lab (B4)
	F
556-557	Fire Substation (D5)
89	Flagg Hall (E3)
7	Foellinger Auditorium (D4)
1073	Forbes Natural History Building (G2)
172	Foreign Languages Bldg (D4)
64	Freer Hall (D5)
	G
201	Garage/Car Pool (F1)
128	Geological Survey Lab (D1)
74	Govt & Public Affairs, Inst of (D5)
324	Grainger Engr Library Info Ctr (B4)
43	Gregory Hall (D4)
1241	Gregory Place II (School of Social Work) (D5)
	H
4	Harding Band Bldg (D4)
25	Harker Hall (C4)
	Hartley Gardens see A 374
356	Hallene Gateway (C6)
46	Henry Admin Bldg (C4)
217	Housing Food Stores (E1)
58	Huff Hall (D3)
152	Hydrosystems Lab (A5)
	I
14	Ice Arena (D3)
1214	I Hotel & Conference Center (G2-3)
1247	Ikenberry Dining Hall (D3)
65	Illini Hall (C4)
23	Illini Union (C4)
106	Illini Union Bookstore (C4)
316	Illinois Field (F4)
369	International Studies Bldg (C3)
1080	Institute for Genomic Biology (D5)
381	Irwin Academic Services Ctr (D3)
407	Irwin Indoor Football Pract Fclty (E3)
	J-K
354	Japan House (G6)
21	Kenney Gym (B4)
5	Kenney Gym Annex (B4)
220	Krannert Art Museum & Kinkead Pavillion (E3)
52	Krannert Ctr for Performing Arts (C5)
	L
218	Labor & Employment Relations, School of (D3)
	Large Animal Clinic see V 292
156	Law Bldg (E3)
126	Levis Faculty Ctr/Visitor Ctr (C5)
41	Library (D4)
331	Library & Information Science (C3)
27	Lincoln Hall (D4)
67	Loomis Lab (B5)
	M
336	Madigan Lab (D5)
178	Mailing Ctr (F1)
34	Materials Sci & Engr Bldg (B5)
3	McKinley Health Ctr (E6)
171	Meat Science Lab (E5)
112	Mechanical Engineering Bldg (B5)
29	Mechanical Engineering Lab (B5)
192	Medical Sciences Bldg (C5)
72	Memorial Stadium (E3)
237	Micro & Nanotechnology Lab (B4)
242	Morrill Hall (C5)
69	Mumford Hall (D4)
125	Mumford House (E4)
39	Music Bldg (D5)
506	Music Education Annex (D6)
	N
124	National Soybean Rsch Ctr (E5)
568	Native American House (D5)
32	Natural History Bldg (C5)
109	Natural Resources Bldg (E4)
321	Natural Res Studies Annex (G1)
564	NCSA (A5)
1244	NCSA Petascale Computing Facility (F1)
24	Newmark Lab (B4)
90	Noble Hall (E3)
232	North Campus Chiller Plant (A5)
1094	North Campus Parking Deck (A5)
12	Noyes Lab (C5)
117	Nuclear Engineering Lab (B5)
110	Nuclear Physics Lab (E1)
48	Nuclear Radiations Lab (B5)
267	Nursing, School of (C5)
	O
33	Observatory (D5)
196	Optical Physics & Engr Lab (B4)
	P
97	Parking Structures (C3, A5)
556-557	Parking Structure/Fire Substation (D5)
154	Personnel Services Bldg (D2)
198	Physical Plant Service Bldg (E1)
	Plant & An Biotech Lab see M 336
865	Plant Clinic (G4)
256	Plant Sciences Lab (E5)
77	Plant Services Bldg NE (B5)
163	Plant Services Storage Bldg (B5)
358	Police Training Institute (D3)
100	President s House (F6)
144	Printing Services Bldg (D2)
509	Professional Arts Bldg (B4)
76	Psychology Bldg (C4)
323	Public Safety (B5)
	R
176	Rehabilitation Education Ctr (D1)
	Research Park (G2)
551	Richmond Studio (A5)
1268	Robert A. Evers Laboratory (G2)
116	Roger Adams Lab (C5)
	S
1241	School of Social Work (Gregory Place II) (D5)
66	Seitz Materials Research Lab (B5)
563	Siebel Ctr for Computer Sci (B5)
	Small Animal Clinic see V5
60	Smith Hall (D4)
209	Speech & Hearing Clinic (C4)
373	Spurlock Museum (C6)
166	State Farm Center (F3)
40	Stock Pavilion (E4)
71	Student Services Arcade Bldng (E4)
164	Structural Warehouse (B5)
95	Superconductivity Ctr (B5)
59	Surveying Bldg (D4)
193	Swanlund Admin Bldg (C4)
	T
161	Taft House (E5)
13	Talbot Lab (B4)
1083	Technology Place (C4)
339	Temple Hoyne Buell Hall (E4)
355	Tower on Third (C3)
304	Track & Soccer Stadium (F4)
42	Transportation Bldg (B5)
197	Turner Hall (E5)
131	Turner Hall Greenhouses (E5)
188	Turner Student Services Bldg (C4)
	U
257	Ubben Basketball Facility (F3)
99	Undergraduate Library (D4)
61	University High School (B5)
63	University High School Gym (B5)
255	University Press Bldg (E1)
	V
1016	Vegetable Crops Bldg (D5)
1265	Vermillion Development Bluilding (C3)
350	Vet Med Basic Sciences Bldg (G5)
341	Vet Med Feed Storage Bldg (G5)
287	Vet Med Surgery & Obstetrics Lab (G5)
292	Vet Teaching Hospital (G5)
	Visitor's Center see L 126
56	Vivarium, Shelford (B4)
155	Volatile Storage Bldg (E1)
	W
183	Wood Engineering Lab (E5)
159	Wohlers Hall (D4)
	Z
1074	Z Bldg (G2)

BUILDINGS BY ADDRESS

262	510 East Chalmers (C4)
235	512 East Chalmers Street (C4)
362	507 East Daniel Street (C4)
250	912 South Fifth Street (C3)
353	505 East Green Street (C4)
1262	507 East Green Street (C4)
173	708 South Mathews Avenue (D5)
367	901 W. Oregon (D6)
195	1203 West Nevada Street (D5)
207	1203 West Nevada Street (D5)
151	1204 West Nevada Street (C4)
146	1205 1/2 West Nevada Street (C4)
184	1208 West Nevada Street (C4)
205	1203 West Oregon Street (D5)
238	1207 West Oregon Street (D5)
221	805 West Pennsylvania (E6)
214	911 South Sixth Street (C4)

UNIVERSITY RESIDENCE HALLS

Undergraduate Halls

Champaign Residence Halls

BR	Barton (D3)
HP	Hopkins (E2)
IR	Ikenberry (D3)
LN	Lundgren (D3)
NU	Nugent (D3)
BH	Bousfield Hall (D2)
SC	Scott (E2)
SN	Snyder (E3)
TF	Taft (E3)
VD	Van Doren (E3)
WS	Weston (D3)

Urbana North Residence Halls

AL	Allen (D6)
BS	Busey-Evans (D5)
LA	Lincoln Ave (Shelden-Leonard) (D6)
	Illinois Street
TW	Townsend (C6)
WR	Wardall (C5)

Urbana South Residence Halls

Pennsylvania Avenue

BB	Babcock (E6)
BL	Blaisdell (E6)
CR	Carr (E6)
SD	Saunders (E6)

Florida Avenue

OG	Oglesby (E6)
TR	Trelease (E6)

Graduate Halls

DN	Daniels (B5)
SM	Sherman (C3)

Family Housing

AW	Ashton Woods (south of G2)
GG	Goodwin/Green Apts (C5)
OD	Orchard Downs Apts (East of F6)

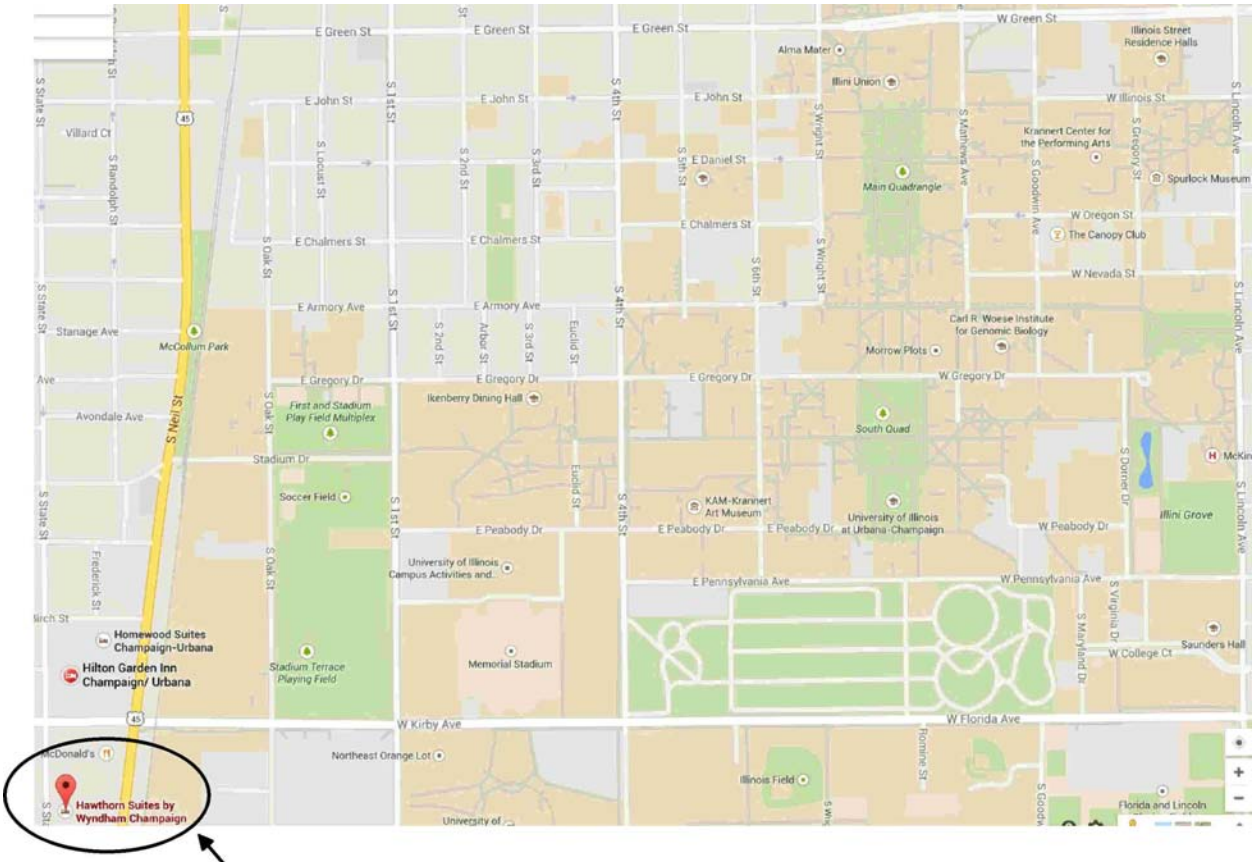
Private Certified Housing

1P	Armory House (D3)
2P	Bromley Hall (C3)
4P	Brown House on Coler (C6)
5P	Christian Campus House (C6)
6P	Europa House (C6)
7P	Hendrick House (B6)
8P	Illini Tower (D3)
9P	Koinonia (C3)
12P	Newman Hall (D4)
14P	Presby House (C3)
15P	Stratford House (C3)
16P	University YMCA (D4)
17P	Nabor House (D6)
18P	Evans Scholars (D3)
19P	NIKA House (C2)
20P	3:12 House (C3)

Updated 10/24/2013

LOCATION OF URBANA AND CHAMPAIGN ON INTERSTATES 57, 74, AND 72

LOCATION OF THE HAWTHORN SUITES IN RELATION TO THE UNIVERSITY OF ILLINOIS CAMPUS DISTRICT



The Hawthorn Suites in Relation to the University of Illinois District

Urbana-Champaign
Don't Miss These Attractions

Krannert Art Museum
Krannert Art Museum offers a rich and comprehensive collection of fine art spanning 6,000 years of world culture. The museum's collections of more than 8,000 works of art represent the cultures of Africa, the Americas, Asia and Europe. In addition to its permanent collection, the museum organizes outstanding temporary exhibitions throughout the year. For more information on Japan House at the University of Illinois please visit http://www.kam.uiuc.edu/

Market Place Mall
Make the trip to Market Place Shopping Center for the complete shopping experience. Shop at over 100 of your favorite stores. The Mall is anchored by Bergner's, JC Penney, and Macy's. For a mall directory visit www.marketplacemall.com.

Campus Town
Students and faculty members take advantage of a commercial area on the University designed to accommodate the collegiate lifestyle. A variety of restaurants, shops, and bookstores are all conveniently located in Campus Town. Only a short walk from the Main Quad and next to the Illini Union, you can pick up a sandwich for lunch, meet up with friends for coffee, and shop for Illini apparel.

Nightlife
For those looking for nightlife, downtown Champaign, a few blocks away, offers a greater diversity of clubs and restaurants.