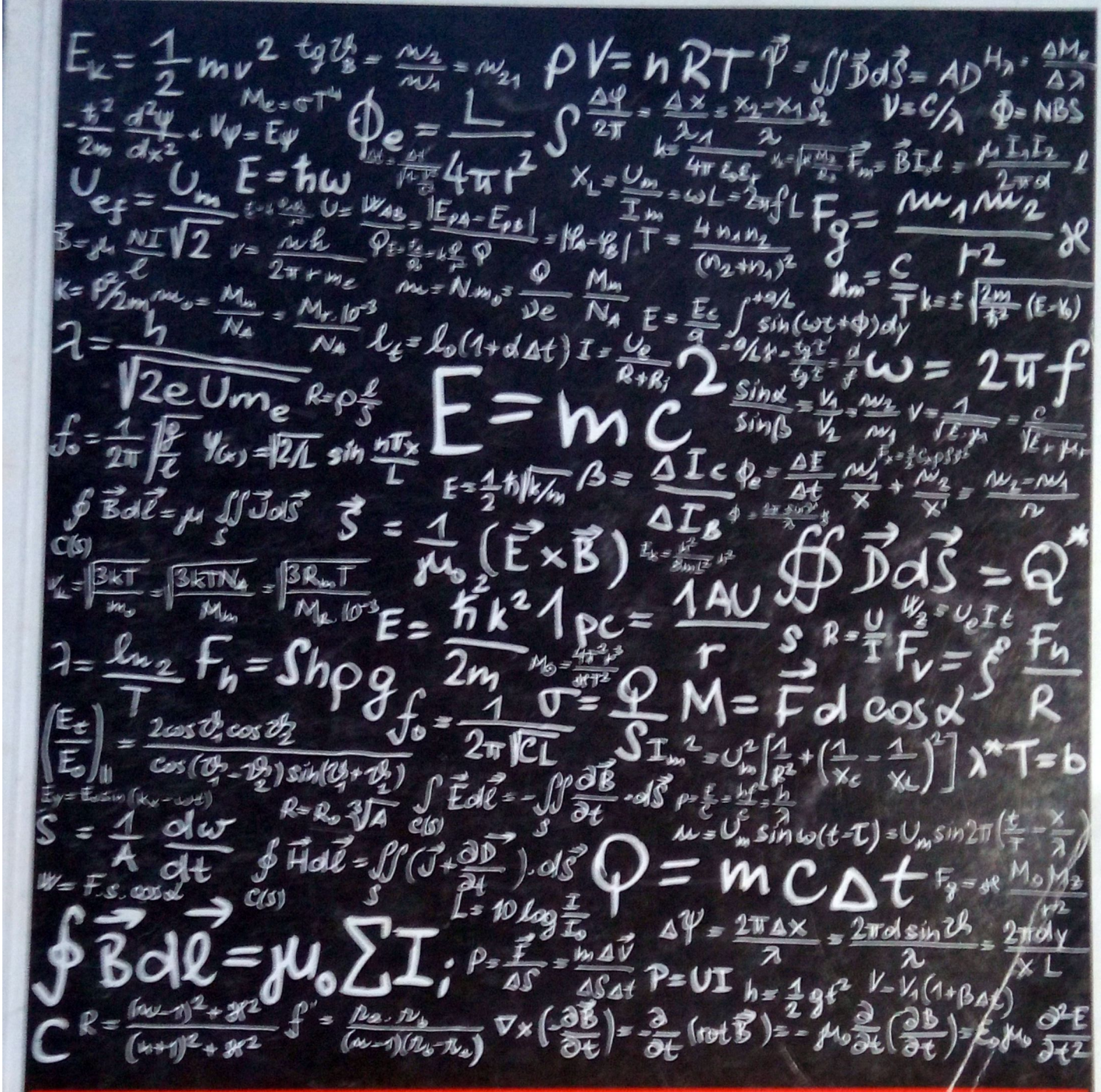
UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE



RESEARCH & INNOVATION DAY

26 October 2017 • Westville Campus

INSPIRING GREATNESS

Rasheed Adeyemi

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

College of Agriculture, Engineering and Science
Postgraduate Research and Innovation Day 2017
Westville Campus

The College of Agriculture, Engineering and Science would like to express its grateful thanks to the following internal partners of the 2017 College Postgraduate Research and Innovation Day:

- UKZN School of Agricultural, Earth and Environmental Sciences
- UKZN School of Chemistry and Physics
- UKZN School of Engineering
- UKZN School of Life Sciences
- UKZN School of Mathematics, Statistics and Computer Science
- UKZN Information and Communication Services Division
- UKZN InQubate
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- Centre for Quantum Technology
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- Professor Sivakumar Venkataraman
- Professor Sreekantha Jonnalagadda
- Professor Steve Johnson
- Professor Sunil Maharaj
- Professor Vincent Nyamori

PROGRAMME: RESEARCH DAY

Thursday 26 October 2017, T Block, Westville Campus

08:00 – 08:50 **Registration** – Guests, Judges and Exhibitors: Downstairs T Block entrance,
Posters, oral & General Attendees: Upstairs
Innovation Stream: Outside T4

08:55 **OPENING PLENARY** (T1) **Professor Kevin Kirkman**, Dean of Research, CAES

08:55 – 09:15 **Introduction – Professor Thomas Konrad**, School of Chemistry and Physics

Official Welcome – Professor Deresh Ramjugernath, Deputy Vice-Chancellor, Research

Role of InQubate – Mrs. Suvina Singh, Director, UKZN InQubate

09:15 – 09:45 **Keynote Lecture – Professor Andrew Forbes**, School of Physics, University of the Witwatersrand

Science can be done anywhere, by anyone?

09:50 – 11:10 **Session 1 – ORAL PRESENTATION**

Time/ Venue	T5 SAAES	T6 SLS	T1 SCP	T2 SE	T7 SMSCS
09:50 – 10:10	SAEES-O-01 Dlamini Z	SLS-O-01 Cozien R	SCP-O-01 Adebisi M	SE-O-01 Biyela P	SMSCS-O-01 Adeyemi R
10:10 – 10:30	SAEES-O-02 Jagarnath M	SLS-O-02 Eregie S B	SCP-O-02 Amollo T	SE-O-02 Garber S	SMSCS-O-02 Adonu M
10:30 – 10:50	SAEES-O-03 Mchunu L	SLS-O-03 Erukainure O	SCP-O-03 Ezekiel I	SE-O-03 Hassanalizadeh R	SMSCS-O-03 Brassel B
10:50 – 11:10	SAEES-O-04 Mkhabela S	SLS-O-04 Isah M B	SCP-O-04 Gaitho F	SE-O-04 Ilunga G I	SMSCS-O-04 Dulamuu N

11:10 – 11:40 **Tea**

11:40 – 13:00 **Session 2 – ORAL PRESENTATION**

Time/ Venue	T5 SAAES	T6 SLS	T1 SCP	T2 SE	T7 SMSCS
11:40 – 12:00	SAEES-O-05 Mthethwa N	SLS-O-05 Jacobs C	SCP-O-05 Govender P	SE-O-05 Kakonke G	SMSCS-O-05 Gatatanzi P
12:00 – 12:20	SAEES-O-06 Musokwa M	SLS-O-06 Mdlalose T	SCP-O-06 Majola M	SE-O-06 Mwenje R	SMSCS-O-06 Gusiu M D
12:20 – 12:40	SAEES-O-07 Muzah O	SLS-O-07 Moyo C	SCP-O-07 Mbuyise X	SE-O-07 Nabangala M	SMSCS-O-07 Joel L O
12:40 – 13:00	SAEES-O-08 Ngcobo B	SLS-O-08 Mukundwa A	SCP-O-08 Mpofu K	SE-O-08 Ogbodo E	SMSCS-O-08 Matondo D

ORAL ABSTRACTS

ROOM T7 – SMSCS ORAL PRESENTATIONS
Chair: Professor Serestina Viriri

SMSCS-O-01

SPATIAL PATTERNS OF CHILDHOOD MORTALITY AND MORBIDITY IN SUB-SAHARAN AFRICA: A BAYESIAN GEO-ADDITIVE MULTINOMIAL MODELS APPROACH

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Background: In epidemiological studies, several diseases share common risk factors. The jointly modelling of the risks of multiple diseases can provide the epidemiologists and health practitioners the aetiological patterns of the incidence (mortality rates) across ecological areas.

Methods: This paper investigates the differences in small scale geographical variations and the risk factors on child's health outcomes (infant mortality) and co-infections (diarrhoea, fever, cough and low birth weight) in the African sub-regions. The cross sectional data was obtained from Demographic and Health Surveys from Nigeria and Tanzania. We model spatial heterogeneity within the sample population using a flexible structured geo-additive regression model. The inference was based on the Bayesian MCMC simulation technique.

Results: The results indicated that the proportion of low birth weight mortality deaths was found to 43.4% for Nigeria and 31.4% in Tanzania. The overall prevalence were: diarrhoea (9.4%), fever (35.5%) and cough (13.8%) in Nigeria; and diarrhoea (10.9%), fever (16.3%) and cough (14.9%) for Tanzania. We estimated correlation between the diseases to evaluate the `share risks' in the co-morbidity across the geographic areas. The multivariate analysis revealed that the risk factors such like non-antenatal attendance, multiple birth, short birth intervals, low maternal education, and poor sanitation were associated with infant mortality and childhood morbidity. In addition to the statistical relevance, we produce predictive spatial maps that detect high risk regions, "hot spots" which can assist developing partners and government to channel scarce health resources in an effective manner.

Conclusion: The findings can guide in evidence-based allocation of scarce health resources in the sub-region with the aim of improving the chance of child survival.

Keywords: Sub-Sahara, Ecology, Spatial Epidemiology, Under-five children, Disease mapping, spatial statistics.
