# BIOGRAPHICAL SKETCH
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NAME: Gideon KD Zamba

eRA COMMONS USER NAME (credential, e.g., agency login): ZAMBAG

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| Universite du Benin, Lome-Togo, West Africa | MS-BS | 1995 | Applied Mathematics |
| School of Statistics, University of Minnesota | MS | 2003 | Statistics |
| School of Statistics, University of Minnesota | PhD | 2003 | Statistics |

## A. Personal Statement

## B. Positions and Honors

### Positions and Academic Appointments

2003-2004    Visiting Assistant Professor, Department of Biostatistics, The University of Iowa College of Public Health
2004-2006    Assistant Professor (Clinical), Department of Biostatistics, The University of Iowa College of Public Health
2005-    Assistant Professor (Joint Appointment), Biostatistics Core, Holden Comprehensive Cancer Center, The University of Iowa
2006-2012    Assistant Professor (Tenure-track), Department of Biostatistics, The University of Iowa College of Public Health
2012-    Associate Professor, Department of Biostatistics, The University of Iowa College of Public Health

### Honors and Awards

1997    Distinguished Instructor Award; Kouvahey College, Lome-Togo, West Africa
2000    Winner of a NSF Travel Award to attend the First Midwest Conference in Experimental Design in Columbus, OH
2001    Winner of the Society of Industrial and Applied Mathematics travel award to attend the First International Conference in Data Mining in Chicago, IL
2002    Excellence in Teaching Award; University of Minnesota, School of Statistics
2011    Faculty Teaching Award, University of Iowa College of Public Health
2012-14    Teaching Scholar Program, University of Iowa Carver College of Medicine
2016    Delta Omega Honor Society
2018    Faculty Service Award, College of Public Health, University of Iowa
2018    Dr. Carol S. Gleich Development Award, College of Public Health, The University of Iowa

## C. Contributions to Science

My research contributions to science have been in methodological statistics and also in application of statistical methodology to address general classes of biomedical problems. My specific areas of methodological contribution are:

change point problems; sequential analysis; recurrent events; and syndromic surveillance. Areas of collaborative contributions are: glaucoma; emphysema; influenza and cancer. A selected listing of my published work can be found at http://www.myweb.uiowa.edu/gzamba/index_files/GZ_CanonicalCV.pdf .

**1- Sequential Analysis and Change Points:** My early work explored sequential multivariate change point detection in dynamic control theory. This work was undertaken using a generalized likelihood ratio test applied between various hypothetical pre-change and post change series for data that accrue serially. The technicality consists of applying the classical fixed-sample change point formulation to sequential processing by defining a repeated testing scheme in which as a new observation accrues, the change point test is reapplied to the accumulated data in a way that the probability of type I error remains constant. The multivariate adaptation of this method has been instrumental in change point detection in medical ambulatory monitoring. The approach has since then been widely used in industrial statistics.

**Zamba KD.**, Hawkins DM.(2009) "A Multivariate Change point Model for Change in Mean Vector and/or Covariance Structure," *Journal of Quality Technology* 41(3), 539—549

**Zamba KD.**, Hawkins DM.(2006) "A Multivariate Change point Model for Statistical Process Control," *Technometrics* 48(4), 539—549

Hawkins DM., **Zamba KD.**(2005) " Statistical Process control for Shift in mean or Variance using a Change Point Formulation," *Technometrics* 47(2) 164—173.

**2- Syndromic Surveillance and Disease Monitoring:** A second line of research and contribution to science examined some key issues pertaining to bio-surveillance; as bioterrorism became a focus in the US. As most biological weapons, when released, operate with symptoms similar to some infectious diseases, the focus has been centered on using medical data to assess evidence for biological activity. My work in this area defines a shift in medical information processing from the classical retrospective chart review to a prospective and real-time disease surveillance in which clinical data become investigational tools to report early biological activity to sentinels and augment medical diagnoses. My work in this area uses Bayesian thinking to prospectively model and detect unusual activity through sequential Bayes model-switching techniques, in order to monitor disease profiles such as seen in influenza-like illnesses.

**Zamba KD.**, Tsiamyrtzis P., Hawkins DM. (2013) "A Three-State Recursive Sequential Bayesian Algorithm for Biosurveillance," *Computational Statistics and Data Analysis,* 58, 82—97

**Zamba KD.**, Tsiamyrtzis P., Hawkins DM. (2008) "Sequential Bayesian Control Model for Influenza-like-illnesses and Early Detection of Intentional Outbreak," A Multivariate Change point Model for Statistical Process Control," *Health Edition of Quality Engineering* 20(4), 495—507

**3- Recurrent Events Distribution Estimation and Testing:** My most recent methodological work has been in the area of the longitudinal assessment of episodes of recurrent events, including the estimation of their inter-event time distribution and their hazard functions, in the presence of within-subject events correlation, and the testing mechanism of their distribution function against a parametric family for prediction and inferential purposes. This work is having a great impact as it provides a ground breaking development that has led to new statistical testing mechanisms in the area of recurrent events analyses.

Adekpedjou A., Withanage D-MA., **Zamba KD.** (2015) "Data Dependent Cells Chi-Squared Test With recurrent Events," *Scandinavian Journal of Statistics,* doi: 10.1111/SJOS.12150.

Adekpedjou A., **Zamba KD.** (2012) "A Chi-Squared Goodness-of-fit Test for Recurrent Event Data," *Journal of Statistical Theory and Application,* 11(2), 97-119.

**Zamba KD.**, Adekpedjou A.(2010) "Parameter Estimation for Correlated Recurrent Events under Informative Monitoring," *Statistical Methodology,* 8, 273—290.

**4- Contribution to Science through Cancer, Influenza, Emphysema, and Glaucoma Research:** My collaborative contributions to science are inextricably linked to my career and research endeavors as a biostatistician. As I hold joint appointments at the Holden Comprehensive Cancer center, I collaborate with investigators on a wide range of biomedical studies, including study designs, preclinical studies and clinical trials to evaluate new cancer treatments, and epidemiologic cancer studies. I also collaborate with investigators in neurology and ophthalmology to develop mathematical models for the spatio-temporal progression of glaucoma. In radiology and human lung assessment, I contribute to the statistical models of emphysema metrics, of lung parenchyma measures and their behaviors within the human lung tree.

Menda, Y., Boles Ponto, LL., Scultz, M.K., **Zamba Gideon K.D.**, Watkins G.L., Bushnell, D.L., Madsen M.T., Sunderland J.J., Graham M.M., O'Dorisio T.M., O'Dorisio,S.M. (2013), "Repeatability of 68Ga-DOTATOC PET Imaging in Neuroendocrine Tumors" *Pancreas* 42(6) 937—43.

Hrabe, J. E., Byrn, J. C., Kapadia, M. R., Button, A., **Zamba, K. D.**, Mezhir, J. J.(2013), "A Matched Case-Control Study of IBD-Associated Colorectal Cancer: IBD Portends Worse Outcome," *Journal of Surgical Oncology* doi 10.1002/jso.23465.

Krishna, I. S., Grout R. W., Wilson, J. M., Cook-Granroth, J. E., **Zamba, K. D.**, Hoffman, E. A. (2012). Repeatability and Sample Size Assessment Associated with Computed Tamography-Based Lung Density Metrics. *Academic Radiology* 1(1) 97—104.

Wall M, Woodward KR, Doyle CK, **Zamba, KD.**, (2010) "The Effective Dynamic Ranges of Standard Automated Perimetry Sizes III and V, Motion and Matrix Perimetry". *Archives of Ophthalmology* 128:570-576.

## D. Additional Information: Research Support and/or Scholastic Performance

**Ongoing Research**

P30 CA086862  (PI: George J. Weiner)
National Cancer Institute                                    7/14/00-3/31/21
Cancer Center Support Grant
Role:  Biostatistician
This Cancer Center Support Grant is to support the Research activities of the University of Iowa Cancer Center.


15SFRN23480000  (PI:  Curt Sigmund; Mark Santillan and Gary Pierce,    4/1/15-3/31/19
Contact PIs for two projects)
American Heart Association
University of Iowa Strategically Focused Hypertension Research Center
Role:  Biostatistician


VA IPA Contract  (PI:  Gideon Zamba)                          4/1/16-3/31/20
US Dept. of Veteran's Affairs, Iowa City VAMC
VA IPA
Role:  PI


P50 CA174521 (PI: M. Sue O'Dorisio)
NIH                                                          9/1/15-8/31/20
Neuroendocrine Tumor Specialized Programs of Research Excellence (SPORE) in Human Cancer
Role: Co-Investigator

A Neuroendocrine tumor SPORE at the University of Iowa will result in advances that have an extraordinarily large clinical impact on the length and quality of life for a rapidly growing population of patients with NETs. The Neuroendocrine Tumor SPORE would 1) support innovative translational research in NETs; 2) provide support to translational investigators through interactive cores; 3) Enlist and encourage new translational researchers in NETs through developmental projects and career development; 4) promote early and accurate diagnosis through outreach to physicians and advocacy groups.


261201700036C-IA  (PI: Michael Schultz)
NIH/ViewPoint Molecular Targeting, LLC                        9/18/17-9/17/19
Evaluation of TeamSTEPPS Implementation for Community Hospital Patient Safety
Role: Biostatistician

This study is designed to prospectively evaluate in community hospitals the elements of the TeamSTEPPS The goal of this project is to optimize the route of administration, timing, and dose concentration of a radiopharmaceutical to maximize tumor accumulation of it in mice. This will lead to the ability to optimize the safety and efficacy of therapy and the ability to perform IND-enabling non-clinical toxicology studies.


R25 HL147231 (PI: Gideon Zamba)                              3/1/19-2/28/22
NIH
Iowa Summer Institute for Research Education in Biostatistics (ISIREB)
Role:  PI
This is a proposal to the National Institutes of Health (NIH), National Heart, Lung and Blood Institute (NHLBI), from the University of Iowa, in response to RFA-HL-19-019 for an Iowa Summer Institute for Research Education in Biostatistics (ISIREB), Summer Programs 2019, 2020, & 2021.

## Completed Research

T15 HL097622 (PI: Gideon Zamba)                                    8/20/09-2/28/16
NIH
Iowa Summer Institute in Biostatistics (ISIB)
Role:  PI
There is a nationwide shortage of biostatisticians and the shortage is having a negative impact on medical and public health research. The goal of this proposed program is to increase the number of minority undergraduates who enter graduate programs in Biostatistics or related areas.  Instruction will be through case-based instruction of real biomedical research; computer laboratory training; projects; and clinical and translational research enrichment activities.

R01 CA167632  (PI: M. Sue O'Dorisio and Yusuf Menda)
National Cancer Institute                                          8/1/12-6/30/17
Image Guided Diagnosis and Therapy of Neuroendocrine Tumors
Role: Co-Investigator
The goals are to determine safety and efficacy of Ga-DOTATOC PET imaging and Y-DOTATOC Therapy in children and adults with neuroendocrine tumors.

R25 HL131467 (PI: Gideon Zamba)                                    2/15/16-1/31/19
NIH
Iowa Summer Institute for Research Education in Biostatistics
Role:  PI
This is a proposal to the National Institutes of Health (NIH), National Heart, Lung and Blood Institute (NHLBI), from the University of Iowa, in response to RFA-HL-16-017 for a Summer Institute for Research Education in Biostatistics. The ultimate vision of our proposed research education program is to increase the number of undergraduates who enter graduate programs in Biostatistics and to maintain a solid underrepresented minority pipeline into biostatistics graduate programs. The proposal is for the University of Iowa (UI) Department of Biostatistics to recruit a diverse group of 18 trainees each year, from 2016 to 2018, with focus on minority, underrepresented and disadvantaged students who wouldn't have otherwise been exposed to the field of biostatistics.