

DR. Sheldon George Bruno Waugh
939 Ramble Run RD,
Middle River, MD, 21220 United States
Mobile: 2394048668 - Ext:
Email: waughsh@gmail.com

Availability:

Job Type: Permanent

Work Schedule: Full-Time

Desired locations:

United States • DC United States • FL United States • GA United States

Work Experience:

U.S. Census Bureau

4600 Silver Hill Road
Suitland, MD 20746 United States

01/2021 – Present

Salary: 103,290.00 USD Per Year

Hours per week: 40

Series: 1530 **Pay Plan:** GS **Grade:** 13

Data Scientist (This is a federal job)

TOP SECRET Security Clearance (granted December 2020)

Duties, Accomplishments and Related Skills:

- Provided expertise in the applications of data science (interdisciplinary analytical, statistical, and programming skills) to develop data-driven solutions for difficult business challenges. Works with stakeholders to improve Census business outcomes by leveraging analytic, statistical and programming techniques to collect, analyze and interpret large or complex data sets to develop data-driven solutions. Improves efficiency and/or quality in Census Bureau research and production activities through state of the art data science methods including, but not limited to, machine learning, neural networks, Natural Language Processing, anomaly detection, regression or association analysis, data mining, data matching, big data principles, web scraping, operations research, business analytics, data visualization, predictive analytics (including forecasting), and/or statistical analysis.

U.S. Army Public Health Center

8252 Blackhawk Rd
Aberdeen Proving Ground, MD 21010 United States

06/2018 – 01/2021

Salary: 90,398.47 USD Per Year

Hours per week: 40

Series: 0601 **Pay Plan:** GS **Grade:** 11/12

Epidemiologist (This is a federal job)

TOP SECRET Security Clearance (granted December 2020)

Duties, Accomplishments and Related Skills:

- Served as head epidemiologist, technical expert and advisor in the Veterinary One Health Division within the Veterinary Services and Public Health Sanitation Directorate (VSPHS), U.S. Army Public Health Center, in the epidemiology and surveillance of both the military and beneficiary animal populations as they relate to specific population assessments and health-related outcome analysis, zoonotic diseases, infectious illnesses, injuries and occupational illness and injury (military working animals), and as related to human biosurveillance through a One Health paradigm.
- Utilized novel coding and scripting languages such as R, Python, VB, SAS and other languages to extract establish, transform and load novel data streams to provide and supplement companion animal surveillance data for entire Public Health Enterprise spanning 3 continents. Utilized machine learning and artificial intelligence to design potential outbreak dashboards, potentially developing a syndromic surveillance solution in companion animal populations. Developed and maintained 3 dashboards and visualizations depicting over 5 years of companion animal disease surveillance data totally over 3 GBs. Established (Extract, Transform, Load) ETL scripting pipelines in order to steam line data management and increase efficiency and decrease human error.
- Planned, utilized, designed and maintained Tableau, ESRI ArcGIS, and other advanced analytical Dashboards depicting the zoonotic burden of disease within the Department of Defense's Companion Animal Population across the Public Health Enterprise spanning 3 Continents. Established a multi-year collaboration with Banfield Pet Hospital, culminating in a US wide catchment area project comparing zoonotic disease rates between Banfield and DOD companion populations.
- Developed work involves assessment of available Department of Defense (DoD) veterinary medical data, including the Department of Veterans Affairs, disease and non-battle injury data and other health outcomes data looking to assess trends and potential associations. Participates in the development of tools and strategies to communicate disease and injury risk. Developed and sustains database and data curation of over 2000+ Military Working Dogs to determine associations between exposures and certain health outcomes and behaviors. Utilized Python and Jupyter Notebooks to visualize time spent on divisional work. Supervised two contactors dealing with the abstraction of MWD clinical data and

the creation of a workable database.

- Planned and executed multiple epidemiological projects aimed at identifying population-based risk factors for zoonotic disease, infections and/or acute or chronic illnesses, injuries, and occupational hazards. Written 7 project proposals approved by an organization-wide Public Health Review Board.
- Led a Directorate-wide initiative to improve the data infrastructure capabilities of VSPHS personnel, specifically as it relates to data management, data science, statistical, mathematical and machine learning modeling. This effort involves capacity building activities such as interventional campaigns, leveraging assets in other DOD organizations, and advocating for strategic hiring at the highest levels of APHC. Involves strategic planning, budgeting, project management, and coordination with senior leaders throughout APHC and DOD. Facilitated the development, progress, sustainment, and improvement of a directorate internal data policy aimed to improve the data infrastructure. Established collaborative efforts with external high-performance computing centers to provide storage, training and 100,000 work hours of computer processing time for the VSPHS Directorate. Collaborated with Visual communication organizations to develop a visual intervention to encourage VSPHS personnel to execute good “data etiquette”.
- Collaborated with external AI
- Principal Investigator of a 350K dollar grant designed to accelerate transformational biomedical studies. The AIMM Award is a \$350K grant intended to support highly creative and innovative projects with the potential to accelerate critical discoveries or major advancements that will significantly impact military health and medicine. The submitted project objectives were to integrate high performance computing, deep and machine learning, and artificial intelligence, within the Army Veterinary Services in order to improve surveillance of companion animal diseases within the DOD. Collaborated with Stanford University to use an algorithm that employs natural language processing and neural networks to "read" veterinary record text and apply diagnostic codes. The project aimed to greatly enhance surveillance capabilities and serve as a precedence on how artificial intelligence can be incorporated into public health surveillance activities within the DOD. Developed scripts and subroutines using R and Python to extract, load and transform over 3K veterinary electronic clinical notes, and plan to expand project to process over 30 GBs of DoD veterinary electronic clinical notes for text extraction and Natural Language Processing. Utilized Pytorch to execute algorithm. Developed plan that successfully navigated the Defense Health Agency's HealthIT governance and requirements based program to obtain DOD EHR data for companion animals.

- The lead of a Directorate-wide initiative to develop a comprehensive data dictionary that details the structure, information, and access issues for every data source routinely used by APHC personnel. Involves strategic planning, budgeting, project management, and coordination with senior leaders throughout APHC and DOD. Project also involves providing context and recording information with regards to information management. Supervised the execution and sustainment of a large-scale effort of dataset and data filed/variable metadata collection.
- Served as Chief scientist and co-project manager for GPAWSS. GPAWSS is a surveillance platform designed to provide surveillance data to inform commanders and VCOs of the distribution, frequency, and incidence of various companion animal diseases. The platform uses multiple heterogeneous data streams including Remote Online Veterinary Record (ROVR) EHR data, laboratory data, and data from a civilian corporate companion animal practice.
- Developed the public health surveillance data infrastructure, establishing the framework for data integration from multiple sources within and outside of the Army Public Health Center. Creates sustains and improves data-driven visualizations and dashboards to display critical GPAWSS measures and statistics. Documents spatio-temporal trends, rates, and relative impacts of zoonotic and infectious illnesses and injuries among the population(s) being studied and prepares the results of findings. Determines approach and alternative solutions to specific problems applying new methods, technology and other advances in the field of epidemiology. Conducts outcome analysis to evaluate interventions of preventive measures to determine their efficacy. Demonstrates proficiency in the management and maintenance of computerized databases generated from projects or outbreak investigations.
- Served as Knowledge Management Officer and Modeling Liaison for the APHC COVID-19 Task Force. Developed and maintained COVID-19 related taxonomy to categorize, collate and organize tasks, request and responses made by the Task Force.
- Served as the advisor and special assistant to the Division Chief for Veterinary One Health. Manages the Military Working Dog (MWD) centralized data repository and veterinary medical biosurveillance operations for both the military and beneficiary animal populations. Collaborates closely with the Department of Veterans Affairs to collect data and develops insights into potential exposures related to deployments and negative health outcome in MWDs and MWD Handlers. Functions as the lead for the One Health centralized MWD data initiative to consolidate all MWD data sources into one combined data system

through collaboration and coordination with key stakeholders for the creation of a new epidemiologic database.

- Utilized Project management from Biosurveillance and epidemiological projects to execute medium to large scale projects that influence the worldwide public health enterprise (beyond my organizational chain of command).
- Produced 13 reviewed presentations and 18 reviewed written documents within the Division for dissemination within military medical community channels; written 2 technical guidance documents for veterinary medical data management and surveillance; relating to data management, spatial data management, zoonotic disease surveillance, machine learning, and potential modeling.
- Prepared and accepted 6 abstracts for presentation at major scientific professional meetings and symposia for the American Public Health Association, Association of Veterinary Informatics, International Society of Disease Surveillance, The Military Health System and the World One Health Congress.
- Attended 6 meetings, conferences, and symposia with representatives of other government agencies, private industry, educational and research institutions as a technical liaison and/or APHC representative.
- Serves as the Veterinary Liaison for the Digital Health Strategic Initiative. A program aimed at improving the data governance footprint of the US Army Public Health Center among the federal government.
- Serves as Veterinary Liaison for the Data Communication Working Group. An organizational-wide working group aimed to facilitate data visualization and data management throughout the US Army Public Health Center.
- Established and utilized Google Documents to encourage immediate feedback and review from multiple personnel, allowing a comprehensive review process.
- Assisted the Global Veterinary Medical Practice (GVMP) with the processing of financial management related data with an overall result of developing high-level visualizations depicting financial data.

Supervisor: MAJ Sara Luciano (410-417-4038)

Okay to contact this Supervisor: Yes

05/2017 - 08/2017

Hours per week: 10

SMART Scholar/Graduate Research Assistant

Duties, Accomplishments and Related Skills:

- Assisted (as Co-investigator) Institutional Review Board-approved studies on trends in infectious diseases, injuries and psychological/behavioral health problems among university students.
- Queried electronic medical records, perform data cleaning and analysis in SAS and R to perform surveillance and identify risk factors and spatio-temporal trends for disease.
- Prepared manuscripts for publication in scientific journals, academic presentations to students, university professors, and community members.

This work was done in addition to full-time (40 hours/week) duties at Army Public Health Center (below)

Supervisor: Robert Cook (cookrl@ufl.edu)

Okay to contact this Supervisor: Yes

U.S. Army Public Health Center

8252 Blackhawk Road

Aberdeen Proving Ground, MD 21010 United States

05/2017 - 08/2017

Hours per week: 40

Epidemiologist

Duties, Accomplishments and Related Skills:

- Wrote SAS and R programs to manage data and perform ad hoc analyses to identify risk factors for various health outcomes among active-duty Army personnel and recruits in support of the installations/Commands
- Assisted with data analysis and text for the Health of the Force report.
- Developed a comprehensive summary of data management and quality of ROVR.
- Attended “Epi Chiefs” calls with DHA Armed Forces Health Surveillance Center.
- Analyze research policies and procedures independently, without review by a supervisor.
- Develop research policies and procedures that affect the conduct of science throughout the APHC.

- Provide technical and policy advice to senior leaders on issues concerning science policy affecting veterinary informatics research, including ethical, regulatory, and technical issues.
- Use quantitative analytical methods (e.g. regression, machine learning, spatial analyses, structural equation modeling, mathematical models) to interpret data for use in scientific products such as publications, reports, posters, and presentations.
- Write reports and journal articles that articulate complex biomedical research findings and policies to audiences of different levels (e.g. organization leadership, hospital commanders, congressional staffers, The Army Veterinary Corps Chief, academics).
- Make oral presentations on science/public health policy to a variety of audiences including civilian government leadership, Army leadership, academics/university professors, leaders and scientists within APHC, and community members (non-experts).

Supervisor: LTC Wendy Mey (wendy.e.mey.mil@mail.mil)

Okay to contact this Supervisor: Yes

Spatial Epidemiology & Ecology Research Laboratory, Department of Geography, University of Florida

2055 Mowry Road
Gainesville, FL, 32610 United States

03/2017 - 06/2018

Salary: 32,000.00 USD Per Year

Hours per week: 40

Bioinformatician and Consultant

Duties, Accomplishments and Related Skills:

- Bioinformatics analyst and developer in genomic and spatial analysis
- Primarily tasked with database management and control of passive surveillance data collection of genomic and spatial data with collaboration with international health organizations.
- Responsible for the creation of data algorithms and specialized software pipelines using R, Python and Github, to identify and classify Multiple Locus

Variable number tandem repeat Analysis (MLVA) data and fragments for phylogenetic analysis.

- Managed multiple efforts to organize and digitize tutorials and technical efforts to provide bioinformatical efforts to mid-low income countries through Github.
- Written multiple digital tutorials and technical efforts to provide bioinformatical efforts to mid-low income countries through Github.
- Collaborated with Walter Reed Army Institute of Research (WRAIR) personnel and leadership to align with SEER lab providing crucial information materials, supplies and bioinformatical related data/information to develop crucial tutorials, analyses and products for the country of Kazakhstan.

Supervisor: Jason Blackburn (3252783232)

Okay to contact this Supervisor: Yes

Emerging Pathogens Institute, Department of Epidemiology, University of Florida

2055 Mowry Road
Gainesville, FL, 32610 United States

08/2014 - 05/2018

Salary: 32,000.00 USD Per Year

Hours per week: 10-40

Bioinformatician and Consultant

Duties, Accomplishments and Related Skills:

- Bioinformatics analyst and developer in metagenomics, methylation and genomic analyses.
- Primarily tasked with database management and control of genomic data collection of informatics data with collaboration with the University of Florida and the Emerging Pathogens Institute.
- Responsible for the creation of data algorithms, informative visualizations specialized software pipelines, using R and Python, to identify and classify metagenomic and genomic data and developing Operational Taxonomic Units for phylogenetic analysis.
- Managed multiple efforts to organize and digitize tutorials and technical efforts to provide open source bioinformatical efforts through Github.

- Written multiple digital tutorials and technical efforts to provide open source bioinformatical efforts through Github.
- Collaborated with multiple UF and international lab personnel and leadership to align with lab providing crucial information materials, supplies and bioinformatical related data/information to develop crucial tutorials, analyses and products for numerous metagenomic studies.
- Managed 3 collaborative metagenomic feeding studies, leading all efforts of the studies including registration, coordination, sustainment, analyses and eventual publication of findings.

Supervisor: Volker Mai ()

Okay to contact this Supervisor: Yes

Education:

University of Florida Gainesville, FL United States
Doctorate 05/2018

Credits Earned: 124 Semester hours

Major: Epidemiology

University of Florida Gainesville, FL United States
Master's Degree 05/2014

Credits Earned: 36 Semester hours

Major: Geography

University of Florida Gainesville, FL United States
Bachelor's Degree 12/2011

Credits Earned: 138 Semester hours

Major: Geography

Job-Related Training:

2012 - Security+

2014 - Summer Institute for Statistics and Modeling of Infectious Diseases

2015 - Dynamical Approaches to Infectious Disease Data

2018 - Lean Six Sigma—Yellow Belt

Affiliations:

Association for Veterinary Informatics - Member, Education Committee
The National Association of County Health Officials - Member
American Public Health Association - Member
AMSUS - The Society of Federal Health Professionals - Member

Professional Publications:

Wijayabahu, A.T., Waugh, S., Ukhanova, M. and Mai, V., 2019. Dietary raisin intake has limited effect on gut microbiota composition in adult volunteers. *Nutrition journal*, 18(1), p.14.

Tagliamonte, M. S., Waugh, S., Prosperi, M., Mai, V. (2019, September). An Integrated Approach for Efficient Multi-Omics Joint Analysis. In *Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics* (pp. 619-625). ACM.

Waugh, S., and Mullaney, S. "Progress towards Companion Animal Zoonotic Disease Surveillance in the US Army." *Online Journal of Public Health Informatics* 11.1 (2019).

Ball, J. D., Fe Agana, D., Waugh, S., Wang, K., James, T. G., Nicolette, G. (2019). Systematically collected information at encounters with HIV-positive students: A review of 10 years of electronic medical records. *Journal of American College Health*, 1-5. PMID: 30681932

Spatial-Genomic Association of Co-Circulating Brucella Strains in Southern Kazakhstan: Phylogenetic Inferences Using MLVA Data, Waugh, S. (Submitted)

Brucellosis Transmission Between Humans and Domesticated Livestock in Southern Kazakhstan: Inferences through MLVA Typing, Waugh, S. (Submitted)

Visualizing the Occurrence of Zoonotic Diseases among Military Associated Canines, Waugh, S. (Submitted)

Jennifer C. Dennis, Tyler Culpepper, Carmelo Nieves, Jr., Cassie C. Rowe, Alyssa M. Burns, Carley T. Rusch, Ashton Federico, Maria Ukhanova, Waugh, S., Volker Mai, Mary C. Christman, Bobbi Langkamp-Henken, Probiotics (*Lactobacillus gasseri* KS-13, *Bifidobacterium bifidum* G9-1, and *Bifidobacterium longum* MM-2) improve rhinoconjunctivitis-specific quality of life in individuals with seasonal allergies: a double-blind, placebo-controlled, randomized trial. *Am J Clin Nutr* 105, 758–767 (2017). PMID: 28228426

Waugh, S. App.: Gut Microbiota Differences in Children From Distinct Socioeconomic Levels Living in the Same Urban Area in Brazil. *Journal of*

Pediatric Gastroenterology and Nutrition (2016). PMID: 28644365

Oliveira, F.P. de, Mendes, R.H., Dobbler, P.T., Mai, V., Pylro, V.S., Waugh, S., Vairo, F., Refosco, L.F., Roesch, L.F.W., and Schwartz, I.V.D. (2016). Phenylketonuria and Gut Microbiota: A Controlled Study Based on Next-Generation Sequencing. PLOS ONE 11, e0157513. PMID: 27336782

Dahl, W. J., Ford, A.L., Ukhanova, M., Radford, A., Christman, M.C., Waugh, S., Mai, V. Resistant potato starches (type 4 RS) exhibit varying effects on laxation with and without phylum level changes in microbiota: A randomised trial in young adults. Journal of Functional Foods 23, 1–11 (2016).

Waugh, S. Apropos: Plasmodium knowlesi malaria an emerging public health problem in Hulu Selangor, Selangor, Malaysia (2009–2013): epidemiologic and entomologic analysis. Parasites Vectors 8, 79 (2015). PMID: 25651916

Mai, V., Waugh, S., Byrd, D., Simpson, D. Ukhanova, M. Novel encapsulation improves recovery of probiotic strains in fecal samples of human volunteers. Appl Microbiol Biotechnol 1–7 (2016). PMID: 27796434

Waugh, S., Varma, D., Striley, C., Cottler, L. Comparing Spatial Techniques to Visualize Hypertension Spread and Risk Factors for Hypertension Using Self-report from Community Participants. Applied Geography (2015). (Submitted)

Professional Presentations:

Waugh, S., Integrating High-Performance Computing and Machine Learning within the Army Veterinary Service to improve Surveillance of Companion Animal Disease within the Department of Defense, AVI Talbot Symposium, 2020

Waugh, S., Integrating High-Performance Computing and Machine Learning within the Army Veterinary Service to improve Surveillance of Companion Animal Disease within the Department of Defense, Military Health System Research Symposium, 2020

Waugh, S., Integrating High-Performance Computing and Machine Learning within the Army Veterinary Service to improve Surveillance of Companion Animal Disease within the Department of Defense, World One Health Congress Annual Meeting, 2020

Bayko, H., Waugh, S., Watkins, S, Mullaney, S , Zoonotic Disease Prioritization for Government and Privately Owned Companion Animal Zoonotic Disease

Surveillance System: Adaptation of the One Health Zoonotic Disease Prioritization Tool, American Public Health Association Annual Meeting, 2019

Waugh, S., Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, International Society of Disease Surveillance Annual Meeting, 2019

Waugh, S., Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, APHC Science Exchange, 2019

Waugh, S., Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, APHC One-Health Day Seminar, 2018

Waugh, S., Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagius, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, UF Emerging Pathogens Institute Research Day, 2018

Waugh, S., Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagius, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, UF Public Health and Health Professions Research Day, 2018

Waugh, S., Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagius, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, AAG Annual Meeting, 2018

Waugh, S., Ball, J. Using statistical approaches to quantify the effects of ridesharing accessibility on Driving under the Influence (DUI) arrests in a university city, American Public Health Association Annual Meeting, 2016

Waugh, S., Varma, D., Striley, C., Cottler, L. Utilizing GIS to Visualize Hypertension Spread: A Comparative Study using HealthStreet Data, American Public Health Association Annual Meeting, 2015

Waugh, S., Varma, D., Striley, C., Cottler, L. Utilizing GIS to Visualize Hypertension Spread: A Comparative Study using HealthStreet Data, UF Public Health and Health Professions Research Day, 2015

Waugh, S.. Geo-Spatial Risk Modeling for West Nile Virus in Tarrant County, TX Using Environmental and Demographic Data, AAG Annual Meeting, 2014

Military Experience:

Headquarters Company, 302nd Maneuver Enhancement Brigade, Chicopee, Massachusetts, United States Army Reserve, Captain, Signal Corps

- Brigade S6 (January 2021 – Present)
- Network Operations Officer (September 2018 – January 2021)

842nd Signal Company, Milton, Florida, United States Army Reserve, Captain, Signal Corps

- Company Commander (September 2015 – 2018)
- Family Readiness Group Liaison (January 2015 – 2018)
- Company Executive Officer (September 2013 – 2015)
- Platoon Leader (December 2011 – 2013)

Awards:

- Army Commendation Medal, U.S. Army Reserve, Milton, Florida (October 2019)
 - Honorable Mention, Student Research Abstract Award, SHES/APHA Annual Meeting (November 2016)
 - SMART Scholarship, Department of Defense, Washington D.C. (August 2016 - May 2018)
 - McKnight Fellowship, Florida Education Fund, Orlando, Florida (August 2014 - May 2018)
 - Ryan Poehling Fellowship Award, University of Florida (December 2013 - May 2014)
 - Army Achievement Medal, U.S Army Reserve, Milton, Florida (June 2014)
 - Army Achievement Medal, U.S Army Reserve, Milton, Florida (December 2013)
 - LTC Samuel W Anderson Scholarship, University of Florida (December 2009 - May 2011)
 - 1LT Mark T Barrett Memorial Award, University of Florida (May 2009 - May 2010)
 - Gold Scholarship, University of Florida (August 2007)
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