BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Juillard, Catherine

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

POSITION TITLE: Associate Professor In-Residence

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
Stanford University, Stanford CA	BA	06/1997	English Literature
University of California, Los Angeles, CA	MD	06/2005	Medicine
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD	MPH	06/2008	Public Health
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD	Fellowship	06/2009	International Health
University of California, San Francisco, CA	Fellowship	06/2013	Surgical Critical Care
University of California, San Francisco, CA	Fellowship	06/2014	Trauma

A. Personal Statement

My research in sub-Saharan Africa on injury, strong track record of mentoring trainees in LMICs, and clinical background as a trauma surgeon have prepared me to conduct the proposed project "*Strengthening the Quantitative Pipeline for Multidisciplinary Trauma Research in Cameroon"*. As a former Peace Corps Volunteer in Senegal, West Africa, I witnessed first-hand the burden of disease due to trauma and other surgical diseases in low- and middle-income countries. This experience allowed me to develop the skillset necessary to perform public health project implementation in culturally diverse environments and made me aware of the dearth of formal training in trauma and injury research. The focus of my research has been improving trauma care in sub-Saharan Africa through the development of injury surveillance systems, trauma quality improvement initiatives, and capacity building. My current position as the founding Co-Director for the Program for the Advancement of Surgical Equity (PASE) at UCLA provides me with diverse resources I can leverage towards research aimed at identifying and mitigating global surgical disease disparity. I have over 13 years of experience working in LMICs with studies conducted in Cameroon and other parts of Sub-Saharan Africa. In Cameroon, I have worked with Dr. Alain Chichom and the University of Buea since 2008 to study the epidemiology of injury, access to surgical care, and quality improvement in trauma care. This partnership has a successful track record of collaborative project execution, trainee mentoring (both US and SSA), funding, and publications. I have also worked with Dr. Alan Hubbard for the past six years to apply data science methods to surgically-related studies in LMICs, including machine learning for trauma outcome prediction, geospatial analysis to inform trauma resource allocation, and cluster-based algorithms to assess socioeconomic status. I have mentored over 40 trainees, 15 of which are LMIC trainees. Multiple trainees have had first-author publications in peer-reviewed journals and obtained competitive grant funding under my mentorship. Our long-term partnership with the Ministry of Public Health provides the potential for replication, dissemination, and generalization of effective interventions. My prior track record has positioned me to successfully lead this project and continue a productive research collaboration while using our findings to create change on a broader scale.

B. Positions and Honors

Positions

2005-2012	General Surgery Categorical Resident, Department of Surgery, UCLA, Los Angeles, CA
2008-2008	Post-Doctoral Fellow, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
2012-2013	Surgical Critical Care Fellow, Department of Surgery, UCSF, San Francisco, CA
2013-2014	Trauma Surgery Fellow, Department of Surgery, UCSF, San Francisco, CA
2014-2018	Assistant Professor In-Residence, Department of Surgery, UCSF, San Francisco, CA
2014-2018	Director, Center for Global Surgical Studies, Department of Surgery, UCSF
2015-2018	Adjunct Assistant Professor for Global Health Sciences, UCSF, San Francisco, CA
2017-2018	Director, The Wraparound Project, Department of Surgery, UCSF
2018-present	Associate Professor In-Residence, Department of Surgery, UCLA, Los Angeles, CA
2018-present	Co-Director, Program for the Advancement of Surgical Equity (PASE), UCLA, Los Angeles, CA
2020-present	Marjorie Fine, MD, Endowed Chair in Clinical General Surgery, UCLA, Los Angeles, CA

Honors
2005	Viola Hyde Scholarship Recipient, UCLA School of Medicine
2006	Outstanding First Year Resident, Department of Surgery, UCLA Medical Center
2007	Cardiothoracic Surgery, Junior Resident of the Year, Department of Surgery, UCLA
2007	Sommer Scholarship Recipient, Johns Hopkins Bloomberg School of Public Health
2008	Delta Omega Honor Society, Johns Hopkins Bloomberg School of Public Health
2011	Wiley Barker Teaching Award in Vascular Surgery, UCLA
2012	Golden Scalpel Teaching Award, UCLA
2012	Administrative Chief Resident, Department of Surgery, UCLA
2012	Outstanding Chief Resident, Department of Surgery, UCLA
2015	Best Poster Award, 46th International Association for Trauma Surgery and Intensive Care (IATSIC) Conference
2015	Best Free Paper Presentation, 46th International Association for Trauma Surgery and Intensive Care (IATSIC) Conference
2016	Association of Academic Surgery/West African College of Surgeons International Visiting Fellowship Award
2017	UCSF Medical Education Center for Faculty Educators Excellence in Teaching Award

Professional Memberships
2001-present	Member, National Peace Corps Association
2005-present	Member, American Medical Association
2005-present	Member, Physicians for Social Responsibility
2007-present	Advisory Board Member, Rubin J. Williams Foundation, a 501c3 non-profit organization
2008-present	Member, Delta Omega Honor Society
2008-present	Member, Physicians for Human Rights
2009-present	Member, American College of Surgeons
2011-present	Member, Longmire Surgical Society
2011-present	Member, Association for Academic Surgeons
2012-present	Advisory Board Member, International Collaboration for Essential Surgery, a 501c3 non-profit
2013-present	Member, Society of Critical Care Medicine
2014-present	Member, Howard C. Naffziger Surgical Society
2015-present	Member, European Society of Trauma and Emergency Surgery
2015-present	Member, Society for Advancement of Violence and Injury Research
2015-present	Member, International Society of Surgery
2015-present	Member, International Association for Trauma Surgery and Intensive Care
2015-present	Member, Alliance for Surgery and Anesthesia Presence
2015-present	Member, San Francisco Surgical Society
2016-present	Member, American Association for the Surgery of Trauma
2017-present	Member, Global Affairs Committee for the Association for Academic Surgery
2017-present	Representative, The G4 Alliance for the Association for Academic Surgery
2017-present	Member, American Association for the Surgery of Trauma
2019-present	Member, Society of University Surgeons

Service to Professional Publications

2014-present BMC Emergency Medicine, Ad-Hoc Reviewer
2014-present Journal of Neurosciences in Rural Practice, Ad-Hoc Reviewer
2015-present British Journal of Surgery, Ad-Hoc Reviewer
2015-present World Journal of Surgery, Ad-Hoc Reviewer
2015-present Journal of Surgical Research, Ad-Hoc Reviewer
2017-present Injury, Ad-Hoc Reviewer
2017-present Global Public Health, Ad-Hoc Reviewer
2017-present Journal of Trauma and Acute Care Surgery, Ad-Hoc Reviewer
2017-present Global Public Health, Ad-Hoc Reviewer

C. Contributions to Science

1. **Application of Data Science to Trauma Systems Strengthening**.
Trauma and other surgical diseases have become increasingly appreciated as significant public health problems in sub-Saharan Africa. I have worked with data scientists, such as Alan Hubbard, to apply machine learning and other novel methods to public health challenges in trauma. We have used machine learning for trauma mortality prediction in Cameroon and South Africa and found that it out-performs traditional metrics of prediction, such as Injury Severity Score. Machine learning's agnostic treatment of input variables also allows for inherent contextualization of predictors. We have also developed a cluster-based algorithm to reduce the number of variables that need to be collected to assess socioeconomic status in the acute care setting and validated this algorithm in Cameroon and Ghana. Geospatial analysis is a potentially powerful tool that can be leveraged to inform trauma systems planning, particularly in determining the allocation of hospital-level resources. We have used this in Uganda and Kenya. In Kenya, we partnered with a local tech company in Nairobi, Ma3Route, to utilize geo-localized road traffic crash data and quantify improvements in transport times of injured patients that would be associated with select hospital trauma care resource strengthening.

   a. Christie SA, Hubbard AE, Callcut RA, Hameed M, Dissak-Delon FN, Mekolo D, Saidou A, Mefire AC, Nsongoo P, Dicker RA, Cohen MJ, **Juillard C**. Machine learning without borders? An adaptable tool to optimize mortality prediction in diverse clinical settings. J Trauma Acute Care Surg. 2018 Nov;85(5):921-927. doi: 10.1097/TA.0000000000002044. PMID: 30059457; PMCID: PMC6225991.
   b. Eyler L, Hubbard A, **Juillard C**. Assessment of economic status in trauma registries: A new algorithm for generating population-specific clustering-based models of economic status for time-constrained low-resource settings. *Int J Med Inform*. 2016 Oct.;94(2016):49-58. PMID: 27573311.
   c. Eyler L, Hubbard A, **Juillard C.** Optimization and validation of the EconomicClusters model for facilitating global health disparities research: Examples from Cameroon and Ghana. *PLoS One*. 2019 May 23;14(5):e0217197. doi: 10.1371/journal.pone.0217197.
   d. Lin N, Nwanna-Nzewunwa O, Carvalho M, Wange A, Ajiko MM, **Juillard C**, Dicker RA. Geospatial Analysis of Trauma Burden and Surgical Care Capacity in Teso Sub-region of Eastern Uganda. World J Surg. 2019 Nov;43(11):2666-2673. doi: 10.1007/s00268-019-05095-8. PMID: 31388707.
   e. Eyler Dang L, Hubbard A, Dissak-Delon FN, Chichom Mefire A, **Juillard C**. Right population, right resources, right algorithm: Using machine learning efficiently and effectively in surgical systems where data are a limited resource. Surgery. 2021 Jan 4:S0039-6060(20)30828-X. doi: 10.1016/j.surg.2020.11.043. Epub ahead of print. PMID: 33413920.

2. **Health Equity.** Sub-Saharan Africa is disproportionately affected by injury and other surgical diseases. Within each country, some populations are both more vulnerable to suffer from a surgically treatable condition and less likely to be able to obtain surgical care when they need it. A major focus on my work is identifying disproportionate risk factors for surgical disease and characterizing the barriers to care faced by these most vulnerable populations. Ultimately, we would like to leverage our long-term, strategic partnership with the Ministry of Public Health to identify tangible interventions that will improve access to quality surgical care and reduce health inequity in Cameroon.

   a. Christie SA, Dickson DC, Chichom-Mefire A, Nana T, Stern PMO, Mbiarikai MA, Hubbard AE, Dicker RA, **Juillard C**. Association of Health Care Use and Economic Outcomes After Injury in Cameroon. *JAMA Network Open*. 2020 May 1;3(5):e205171. doi: 10.1001/jamanetworkopen.2020.5171.

b. Kacker S, Bishai D, Mballa GA, Monono ME, Schneider EB, Ngamby MK, Hyder AA, **Juillard C**. Socioeconomic correlates of trauma: An analysis of emergency ward patients in Yaoundé, Cameroon. *Injury*. 2016 Mar;47(3):658-64. PMID: 26763297.

c. Eyler L, Mohamed S, Feldhaus I, Dicker R, **Juillard C**. Essential surgery as a component of the right to health: A call to action. Aug. 2018. *Human Rights Quarterly*. 2018 Aug 40(3); 641-662.

d. Dickson DC, Christie SA, Chichom A, Oben E, Embolo FN, Fonje AN, O'Sullivan P, Akumbu PW, Essi MJ, Dicker RA, **Juillard C**. A Qualitative study of transitions between health care settings after injury in Cameroon. *J Surg Res.* 2019 Dec;244:528-539. doi: 10.1016/j.jss.2019.06.098.

3. **Application of mHealth in vulnerable populations**. As mobile phones increasingly penetrate the world population, there is an increasing opportunity to utilize mHealth to reach traditionally marginalized populations. While much current work in sub-Saharan Africa leverages mHealth to empower community and other care providers, our group is interested in the feasibility and power of mHealth as a way to directly engage with the end-users of the health system: the patients themselves. As most people in Cameroon, Tanzania, and other parts of SSA do not have smart phones, we are interested in finding ways to use simple techniques that do not rely on advanced mHealth technology to reach community members through the cellular network. We are also exploring ways to use mHealth to support vulnerable populations in the United States, such as victims of gun violence, who are at high risk for future violent injury.

a) Christie SA, Mbianyor MA, Dissak-Delon FN, Tanjong MM, Chichom-Mefire A, Dicker RA, **Juillard C**. Feasibility of a Cellular Telephone Follow-Up Program After Injury in Sub-Saharan Africa. World J Surg. 2020 Aug;44(8):2533-2541. doi: 10.1007/s00268-020-05529-8.

b) Patel D, Sarlati S, Martin-Tuite P, Feler J, Chehab L, Texada M, Marquez R, Orellana FJ, Henderson TL, Nwabuo A, Plevin R, Dicker RA, **Juillard C**, Sammann A. Designing an Information and Communications Technology Tool With and for Victims of Violence and Their Case Managers in San Francisco: Human-Centered Design Study. JMIR Mhealth Uhealth. 2020 Aug 24;8(8):e15866. doi: 10.2196/15866. PMID: 32831179; PMCID: PMC7477672.

c) Laytin AD, Seyoum N, Azazh A, Zewdie A, **Juillard CJ**, Dicker RA. Feasibility of telephone-administered interviews to evaluate long-term outcomes of trauma patients in urban Ethiopia. Trauma Surg Acute Care Open. 2018 Nov 30;3(1):e000256. doi: 10.1136/tsaco-2018-000256. PMID: 30588508; PMCID: PMC6280902.

4. **Trauma quality improvement in sub-Saharan Africa.** The work I have done with the WHO and the Ministry of Public Health in Cameroon has helped define the importance of trauma QI globally in reducing trauma morbidity and mortality and highlighting possible ways these methods can be adapted to austere settings. Trauma QI has the potential to find cost-effective and efficient ways to organize trauma care with existing resources to help improve the process of care and ultimately the outcomes. The basis for much of our trauma quality improvement work relies on an ongoing data collection system in Cameroon called the Cameroon Trauma Registry (CTR). Trauma registries in high-income countries have been used in a variety of ways, including applied epidemiology, injury prevention, and quality improvement projects, to reduce the burden of injury. In sub-Saharan Africa, the constraints of resources and time conspire to inhibit injury data collection commensurate with the substantial burden of disease in this setting. We have worked with the University of Buea and the Ministry of Public Health in Cameroon to create an ongoing injury surveillance system through the CTR that has served as the foundation for our current quality improvement research.

a) **Juillard CJ**, Stevens KA, Monono ME, Mballa GA, Ngamby MK, McGreevy J, Cryer G, Hyder AA. Analysis of prospective trauma registry data in Francophone Africa: a pilot study from Cameroon. World J Surg. 2014 Oct;38(10):2534-42. doi: 10.1007/s00268-014-2604-1. PMID: 24791906.

b) Mock CM, **Juillard C**, Joshipura M, Goosen J. Strengthening care for the injured: Success stories and lessons learned from around the world. World Health Organization: 2010.

c) Mock CM, Juillard C, Brundage S, Goosen J, Joshipura M. Guidelines for trauma quality improvement programmes. World Health Organization: 2009.

d) **Juillard C**, Mock C.M, Goosen J, Joshipura M, Civil I. Establishing the Evidence Base for Trauma Quality Emprovement: A Collaborative WHO-IATSIC Review. World J Surg. 2009 May;33(5):1075-86.

e) Ding K, Nguyen N, Carvalho M, Dissak Delon FN, Mekolo D, Nkusu D, Tchekep MS, Oke RA, Mbianyor MA, Yenshu EV, Boeck M, Collins C, Jackson N, Mefire AC, **Juillard C**. Baseline Patient Safety Culture in Cameroon: Setting a Foundation for Trauma Quality Improvement. J Surg Res. 2020 Nov;255:311-318. doi: 10.1016/j.jss.2020.05.068. Epub 2020 Jun 25. PMID: 32593889

Complete List of Published Work in MyBibliography:

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

Ongoing Research Support

R21 TW010453 (Juillard, Chichom)   11/19/2018-04/30/2021
NIH/FIC
Building Capacity for Trauma Quality Improvement: An Innovative Pilot Program in Cameroon to Address the Burden of Injury
The major goals of this project are: (1) establish and train a peer-driven trauma care quality improvement committee in Cameroon; (2) train four quality improvement fellows and a trauma quality improvement program manager; (3) apply the quality improvement process to refine the existing trauma registry data collection tool; and (4) implement quality improvement committee meetings to propose context-appropriate trauma quality improvement interventions for future implementation in Cameroon and similar settings.

R21 TW010956 (Juillard, Chichom)   11/19/2018-08/31/2021
NIH/FIC
Mobile Phone-based Triage Tool to Identify Discharged Trauma Patients in Need of Further Care in Cameroon
The major goals of this project are: (1) Establish the feasibility of using mobile phones to follow up on hospitalized trauma patients after discharge in Cameroon. (2) Cross-validate a telephone-based triage tool to identify trauma patients who would benefit from further medical care. (3) Characterize the impact of timely follow-up on long-term disability and socioeconomic consequences associated with trauma in Cameroon.

UCLA Department of Surgery (Juillard)   01/01/2019-12/31/2022
Research Startup Award
Funding for development of UCLA Program for the Advancement of Surgical Equity (PASE). PASE aims to reduce the disparities in surgical disease outcomes by promoting collaborative research, community partnerships, and supporting capacity building through training and education. This award provides continued support for the Cameroon Trauma Registry.

Completed Research Support

Bank of America Grant (Juillard)   07/01/2017-06/30/2018
Wraparound Project Arts Project, Vocational Training Program
The goal of this project is to provide transitional employment for victims of violent injury.

UCSF Department of Surgery (Dicker, Juillard)   08/01/2014-07/31/2018
Center for Global Surgical Studies
Funding for development of the Center for Global Surgery Studies at UCSF. The Center for Global Surgical Studies will support the use of established academic pillars (research and education) to create meaningful change in access to surgical care and by reducing the surgical disease burden in low- and middle-income countries.

UCSF Department of Surgery (Juillard)   10/01/2014-09/30/2018
Research Startup Award
Funding for development of the UCSF Center for Global Surgery Studies. The Center for Global Surgical Studies supports the use of established academic pillars (research and education) to reduce the surgical disease burden in low- and middle-income countries.

Faculty Research Fellowship (Juillard)   11/19/2018-06/30/2020
American College of Surgeons
Building Capacity for Trauma Quality Improvement in a Resource-Poor Country
The major goals of this project are: (1) Establish a peer-driven trauma care quality improvement committee in Cameroon that can perform comprehensive case review and root cause analysis to identify specific correctable deficiencies. (2) Apply the quality improvement process to refine the existing trauma registry tool, enhancing its capacity to capture changes in the quality of clinical care delivery. (3) Implement quality improvement committee meetings to propose context-appropriate trauma quality improvement interventions for future implementation in Cameroon and similar settings.