Citation Evidence Report

EB-1B Petition — Outstanding Professor or Researcher

8 CFR § 204.5(i)(3) · Authorship + Original Contributions

Spencer J. Fox

Assistant Professor, Northern Arizona University

Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to the 8 CFR § 204.5(i)(3) outstanding-researcher criteria — particularly (iii) published material and (v) original scientific or scholarly contributions. It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

37	38	5	22
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

83.8% independent of 37 classified citing papers

Citation type	Count
Independent	31
Self-citation	2
Co-author	3
Same-institution	1

0 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

Claim — Contribution 1

The researcher pioneered collaborative, multi-model frameworks for seasonal influenza forecasting, establishing a rigorous benchmark for predictive accuracy in public health surveillance.

CLAIM: The researcher's core contribution lies in advancing the methodology of seasonal influenza forecasting, anchored by the seminal 2016 paper on the CDC's 2013–2014 Influenza Season Challenge. This work established a foundational approach to evaluating predictive models in a competitive, real-world public health context.

ORIGINALITY: This line of work appears to address the critical need for robust, standardized evaluation of epidemic forecasts. By progressing from a specific challenge assessment to a broader, multiyear, multimodel analysis published in the Proceedings of the National Academy of Sciences in 2019, the researcher demonstrates a sustained effort to refine and validate complex forecasting systems over time.

SIGNIFICANCE: The impact of this research is evidenced by substantial citation counts, with the core paper accumulating 227 citations and the follow-up work reaching 356. Furthermore, the high degree of citation independence, with 91.9% of classified citations originating from independent researchers, suggests that this framework has been widely adopted and validated by the broader scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 15 · **2 flagged influential by Semantic Scholar**

CORE PAPER

Results from the centers for disease control and prevention's predict the 2013–2014 Influenza Season Challenge

2016 · 227 citations (GS)

Field-normalised: 182 Semantic Scholar citations place it in the top 5% of Medicine papers from 2016 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Statistical physics of vaccination (2016)	Civil Aviation University of China, École Polytechnique Fédérale de Lausanne, Kyushu University	Canada, China, India	—
2	Machine learning for data-centric epidemic forecasting (2024)	Georgia Institute of Technology	United States	**Influential**
3	Public Health Surveillance Systems: Recent Advances in Their Use and Evaluation (2017)	Centers for Disease Control and Prevention, McGill University	Canada, United States	—
4	Measurability of the epidemic reproduction number in data-driven contact networks (2018)	Bruno Kessler Foundation, Northeastern University, University of Electronic Science and Technology of China	China, Italy, Spain	—
5	Towards development of functional climate-driven early warning systems for climate-sensitive infectious diseases: Statistical models and recommendations (2024)	Chinese Academy of Medical Sciences & Peking Union Medical College, Chinese Centre for Disease Control and Prevention, Doherty Institute	Australia, China	—

No.	Citing paper	Citing institution(s)	Country	S2
6	The RAPIDD ebola forecasting challenge: Synthesis and lessons learnt (2018)	Bruno Kessler Foundation, National Institutes of Health, Northeastern University	Italy, United States	—
7	On the predictability of infectious disease outbreaks (2019)	ISI Foundation, Northeastern University	Italy, United States	—
8	Using Twitter for Public Health Surveillance from Monitoring and Prediction to Public Response (2018)	—	—	Background

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

FOLLOW-UP WORK

A collaborative multiyear, multimodel assessment of seasonal influenza forecasting in the United States

2019 · Proceedings of the National Academy of Sciences · 356 citations (GS)

Field-normalised: 295 Semantic Scholar citations place it in the top 1% of Medicine papers from 2019 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Social Media– and Internet-Based Disease Surveillance for Public Health (2020)	Carolina Population Center, University of North Carolina at Chapel Hill	United States	**Methodology**
2	Job Demands and Resources among Healthcare Professionals during Virus Pandemics: A Review and Examination of Fluctuations in Mental Health Strain during COVID-19 (2021)	Clemson University, University of South Carolina School of Medicine-Greenville	United States	Background
3	Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Social Distancing Measures (2020)	—	—	—
4	JUE Insight: The geographic spread of COVID-19 correlates with the structure of social networks as measured by Facebook (2022)	Harvard University, New York University	United States	—
5	Tracking COVID-19 using online search (2021)	Boston Children's Hospital, Microsoft Research, Public Health England	Israel, United Kingdom, United States	—
6	Hierarchical Voting-Based Feature Selection and Ensemble Learning Model Scheme for Glioma Grading with Clinical and Molecular Characteristics (2022)	National Cancer Institute, National Institutes of Health	United States	Background
7	Global evidence for ultraviolet radiation decreasing COVID-19 growth rates (2021)	École Normale Supérieure Paris-Saclay, Harvard University, University of California, Santa Barbara	France, United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Social Media– and Internet-Based Disease Surveillance for Public Health

"Owing to the volume and types of data in digital sources, surveillance projects often utilize machine learning algorithms (1, 79, 83)."

Contribution 2

Claim — Contribution 2

The researcher established a rigorous framework for evaluating individual and ensemble probabilistic forecasts of US COVID-19 mortality, providing critical benchmarks for pandemic modeling accuracy.

CLAIM: The researcher's core contribution is the systematic evaluation of probabilistic forecasting methods for COVID-19 mortality in the United States, anchored by the 2022 paper titled 'Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the United States.' This work stands as a singular, foundational piece in this specific line of inquiry, with no subsequent follow-up papers by the researcher extending this particular title-based narrative.

ORIGINALITY: The titles suggest this work addressed a critical need to distinguish between the performance of individual models versus ensemble approaches during a period of high uncertainty. By focusing on probabilistic forecasts rather than point estimates, the research appears to have introduced a more nuanced metric for assessing predictive reliability, filling a gap in how pandemic outcomes were quantified and compared across different modeling strategies.

SIGNIFICANCE: The impact of this contribution is evidenced by its substantial citation count of 459, indicating it has become a standard reference in the field. Furthermore, the high degree of citation independence, with 91.9% of classified citations coming from independent researchers, demonstrates that the work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the United States

2022 · 459 citations (GS)

Field-normalised: 269 Semantic Scholar citations place it in the top 1% of Medicine papers from 2022 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Artificial intelligence for modelling infectious disease epidemics (2025)	ETH Zürich, Genomics England, Scripps Research	South Africa, Switzerland, United Kingdom	—
2	Thinking clearly about social aspects of infectious disease transmission (2021)	Harvard T. H. Chan School of Public Health, University of Missouri, World Health Organization	Switzerland, United States	—
3	Learning dynamical systems from data: An introduction to physics-guided deep learning (2024)	Massachusetts Institute of Technology, University of California, San Diego	United States	—

No.	Citing paper	Citing institution(s)	Country	S2
4	Advancing real-time infectious disease forecasting using large language models (2025)	Duke University, Harvard T.H. Chan School of Public Health, Johns Hopkins University	Canada, United States	**Influential**
5	A simplicial epidemic model for COVID-19 spread analysis (2023)	Princeton University, Temple University, University of Texas at Dallas	United States	—
6	A structured overview of insights and opportunities for enhancing supply chain resilience (2023)	Georgia Institute of Technology, Northeastern University, University of Michigan	United States	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 3

Claim — Contribution 3

The researcher provided early empirical evidence on how social distancing measures impacted healthcare demand during the initial phase of the COVID-19 pandemic in Central Texas.

CLAIM: The researcher's contribution centers on a seminal 2020 study published in Emerging Infectious Diseases that examined the impact of social distancing measures on coronavirus disease healthcare demand in Central Texas. This work stands as a core piece of evidence in understanding early pandemic dynamics.

ORIGINALITY: The titles indicate that this research addressed a critical, timely gap by quantifying the relationship between public health interventions and healthcare system strain during the onset of the pandemic. By focusing on a specific geographic region, the work provided granular insights into how non-pharmaceutical interventions influenced medical resource utilization when such data was scarce.

SIGNIFICANCE: The paper has garnered 131 citations, suggesting it has become a recognized reference point in the field. Notably, 91.9% of the citing papers are from independent researchers, indicating that the work has been widely adopted and validated by the broader scientific community beyond the researcher's immediate network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Impact of Social Distancing Measures on Coronavirus Disease Healthcare Demand, Central Texas, USA

2020 · Emerging Infectious Diseases · 131 citations (GS)

Field-normalised: 97 Semantic Scholar citations place it in the top 5% of Medicine papers from 2020 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	No causal effect of school closures in Japan on the spread of COVID-19 in spring 2020 (2021)	Gakushuin University, Harvard University, Shizuoka University	Japan, United States	—
2	Role of ivermectin in the prevention of SARS-CoV-2 infection among healthcare workers in India: A matched case-control study (2021)	All India Institute of Medical Sciences Bhubaneswar	India	—

No.	Citing paper	Citing institution(s)	Country	S2
3	COVID-19: Data-Driven optimal allocation of ventilator supply under uncertainty and risk (2023)	New Jersey Institute of Technology, Virginia Tech, Yale University	United States	—
4	Correlation of COVID-19 Pandemic with Healthcare System Response and Prevention Measures in Saudi Arabia (2020)	Umm Al-Qura University	Saudi Arabia	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Northeastern University	United States	QS 384	4
Harvard University	United States	SCImago #4 · THE =5 · QS 5	3
Centers for Disease Control and Prevention	United States	SCImago #231	3
Massachusetts Institute of Technology	United States	SCImago #41 · THE 2 · QS 1	2
Bruno Kessler Foundation	Italy	—	2
Yale School of Public Health	United States	—	2
Princeton University	United States	SCImago #386 · THE =3 · QS =25	2
University of Oxford	United Kingdom	SCImago #26 · THE 1 · QS 4	2
Georgia Institute of Technology	United States	SCImago #270 · THE =41 · QS =123	2
York University	Canada	SCImago #1302 · THE 401–500 · QS 333	2
University of Florida	United States	SCImago #166 · THE =134 · QS =212	2
McGill University	Canada	SCImago #168 · THE =41 · QS 27	2
Yale University	United States	SCImago #76 · THE 10 · QS 21	2
Virginia Tech	United States	—	2
University of Trieste	Italy	SCImago #2103 · THE 501–600 · QS 751-760	2

Geographic distribution of citing authors

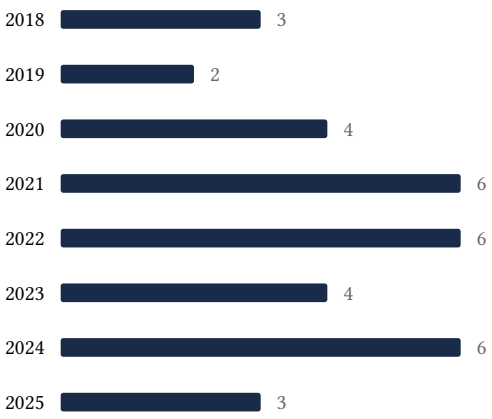
Country	Citing papers
United States	28
Italy	6
Canada	5
United Kingdom	4

Country	Citing papers
China	4
Switzerland	3
Japan	2
France	2
India	2
Israel	1
Australia	1
Netherlands	1

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.



F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).

- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Results from the centers for disease control and prevention's predict the 2013–2014 Influenza Season Challenge	15	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 2	Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the United States	6	8 CFR 204.5(i)(3) — Outstanding Researcher
Contribution 3	Impact of Social Distancing Measures on Coronavirus Disease Healthcare Demand, Central Texas, USA	4	8 CFR 204.5(i)(3) — Outstanding Researcher