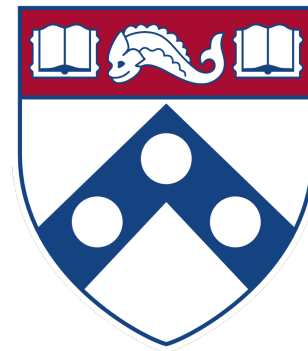


Disadvantage Indices in Addressing Health Disparities

AAYUSH KAPRI, ROWAN UNIVERSITY

MENTOR: HARALD SCHMIDT, MA, PHD

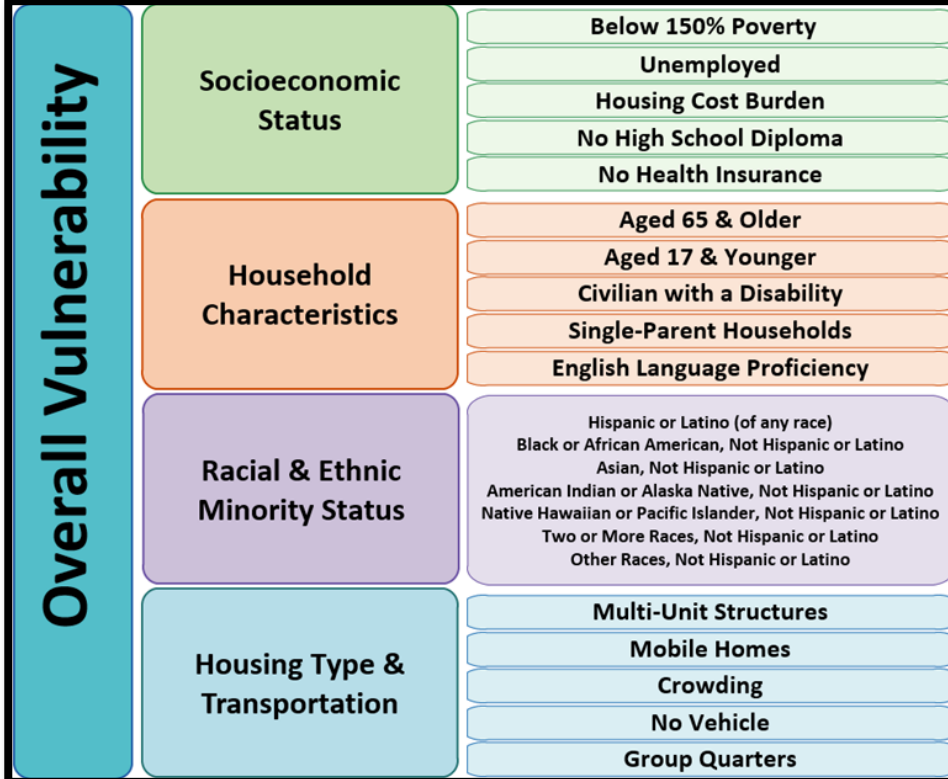


Background

- Emergency situations such as pandemics typically exacerbate inequality
- During the 1918 flu pandemic, areas characterized by elevated unemployment, greater population density, and lower literacy levels experienced significantly higher rates of transmission and a greater cumulative mortality from influenza.¹
- Even during 2020 pandemic, counties exhibiting higher levels of social vulnerability were prone to becoming COVID-19 hotspot areas, particularly those with larger proportions of racial and ethnic minority populations and individuals residing in crowded housing conditions.²

Social Vulnerability Index (SVI)

- CDC SVI is a CDC-developed tool that assesses the social vulnerability of communities in the United States, helping to identify areas at higher risk during public health emergencies like pandemics or natural disasters.³
- In an unprecedented way, SVI was used during COVID-19 to improve equity across social, racial and ethnic groups in allocating scarce resources (e.g., vaccines, ventilators)





Karen Moskowitz, via Getty Images

Opinion

The Way We Ration Ventilators Is Biased

Not every patient has a fair chance.

Give this article

By Harald Schmidt
Dr. Schmidt is an assistant professor in the department of medical ethics at the University of Pennsylvania.
April 15, 2020

Analysis | [Published: 18 May 2021](#)

Equitable allocation of COVID-19 vaccines in the United States

[Harald Schmidt](#) , [Rebecca Weintraub](#), [Michelle A. Williams](#), [Kate Miller](#), [Alison Buttenheim](#), [Emily Sadecki](#), [Helen Wu](#), [Aditi Doiphode](#), [Neha Nagpal](#), [Lawrence O. Gostin](#) & [Angela A. Shen](#)

[Nature Medicine](#) **27**, 1298–1307 (2021) | [Cite this article](#)

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Opinion | Vaccines are about to become a free-for-all. Here's how to ensure it's done equitably.

By Harald Schmidt, Lawrence O. Gostin and Michelle Williams
March 30, 2021 at 12:17 p.m. EDT

FIRST OPINION

Disadvantage indices can help achieve equitable vaccine allocation

By Harald Schmidt Feb. 1, 2021



Utility of SVI

Yes, SVI was made to be used during emergency response to distribute resources to vulnerable communities (example: Covid-19 vaccine response, hurricane response)

But.....

SVI is also found to be correlated to other prevalence which is not necessarily an emergency but still a problem that needs to be addressed (example: firearm violence, obesity, cognitive functioning, etc)

Research Aim 1:

Indices have been used for equitable Covid-19 treatments, emergency care, and tests but the utility of indices is not limited to emergency situations only. So, we focused on identifying and evaluating ways in which disadvantaged indices have been used in different areas, can be used, and should (as well as should not) be used in the future.

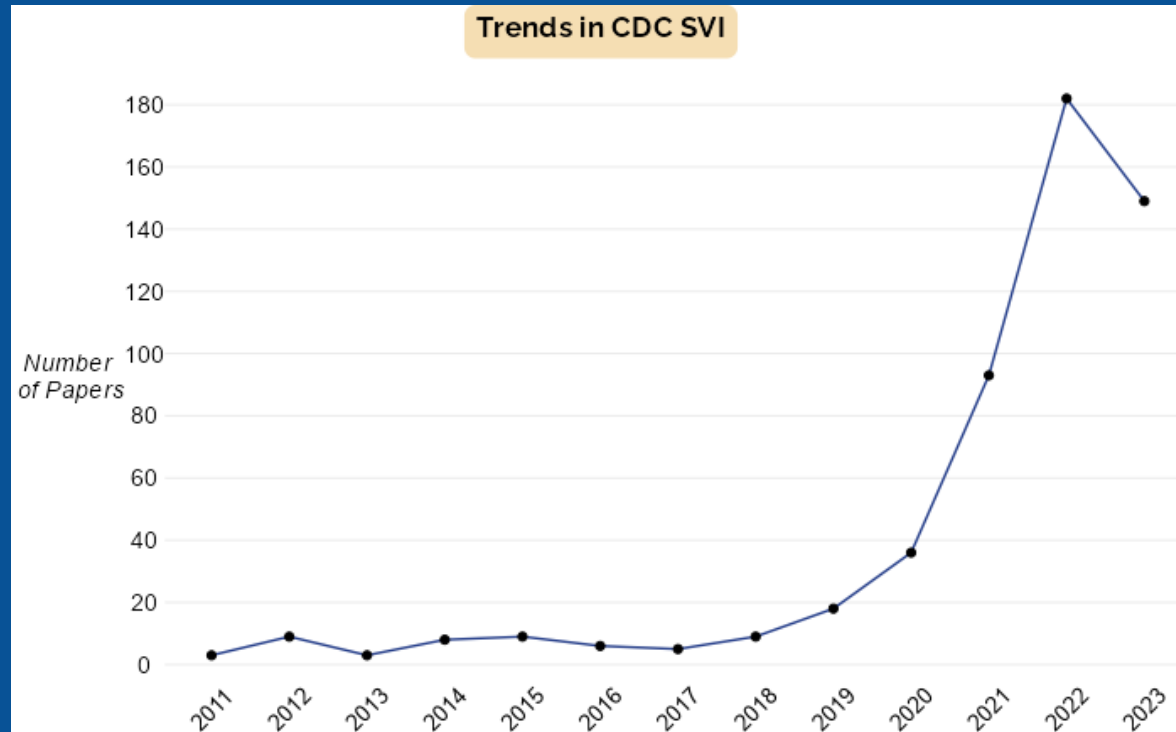


Figure: Papers using “Social Vulnerability Index” in PubMed

Aim 1:

Conducted an extensive Literature Review

- Searched in PubMed for “Social Vulnerability Index”
- N=474 results

Data recorded:

- US status
- Express intention to use SVI as part of analysis for addressing of racial disparities
- Summary of Objective, Methods, Results, Conclusion
- Key statistics
- Policies/actions identified by authors to address inequity using SVI
- Usage area (Natural Disaster, Public Health, Covid-19, Clinical)
- Article type (Peer reviewed, preprint, etc.)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	No.	Source and Citation	US Status (1=yes 0=no)	article type (1= original research, 2=other)	Express intention to use SVI as part of	Objectives Verbatim	Methods Verbatim Text	Results Verbatim Text	Conclusions Verbatim	Key finding (SVI SCORE):	Key finding (SVI SCORE): High SVI groups	Polices/actions identified by authors	Polices/actions identified by authors	(General Topic in sentence format)	natural disaster 1=yes 0 no	other public health 1=yes 0 no	covid 19 1=yes 0 no	Clinical	Methods paper (1=yes, 0=no)	Notes (i.e. did sensitivity analysis, uses)	Journal/academic Paper (yes:1, no:0)	peer reviewed 1= yes, 0=no	Preprint/On line Ahead of Print (yes:1, no:0)	Poster/Conference Abstract (yes:1, no:0)	Other (yes:1, no:0)
2	1	Karmakar M, Lantz PM, Tipirneni R.	1	1	0	Descriptive data have revealed significant	Design, setting, and participants: This cross-sectional study, a	As of July 29, 2020, there were a total of 4	In this cross-sectional study, a	An increase of 0.1 point in SVI score	more likely to have a Covid-19 infection	The difficult but crucial task for	address root causes of disadvantage	WAS: COVID-19 Incidence and Death	0	0	1	0	0	didn't set out to address racism--but	1	0	0	0	0
3		Crowe RP , Kennel J , Fernandez AR , Burton BA , Wang RA , Stokes EK , Pickens CM , Wilt G , Liu S , David F , County-level Cong Z , Feng G , Chen Z , Disaster exposure , Stuart CM , Dyas AR , Byers S , Velopoulos C , Randhawa S , Liu S , Minn SB , Bourand NM , DeClue IL , Delgado GE , Fan J , Patnick ME , Hughes MM , Ali A , Shaw KA , Maenner SM , RP	1	1	1	To evaluate racial and ethnic disparities in out-of-	Using the 2019-2020 ESO Data Collaborative, we	Among 35,711 patients transported by 400 EMS	Among EMS patients with long bone fractures, Black, non-	//	//	As efforts to improve out-of-hospital pain management	//	//	0	0	0	0	0	//	1	1	0	0	0
4	2		1	1	1	Nonfatal drug overdoses (NFODs) are often	We analyzed 2018-2020 emergency department	Generally, as social vulnerability scores increased,	The SVI can help identify associations between social	Similar to NFOD ED visit rates,	more likely to suffer from NFODs (non fatal drug	Ongoing surveillance and analysis of community-	since community level risk factors associated	Health Condition	0	1	0	0	0	//	1	1	0	0	0
5	3 (common)		1	1	0	This study examined how community vulnerability	We pooled two panels of the Federal Emergency	Multi-nomial logistic regression indicated	This study examined the impact of disaster exposure on	Model 2 controlled for both individual variables	The study indicates that while overall		Based on these findings, public disaster	Disaster exposure and disaster preparedness	1	0	0	0	0	//	1	1	0	0	0
6	4		1	1	0	The effect of a patient's Social Vulnerability Index (SVI)	This was a retrospective review of a prospectively collected	Of 149 esophagectomy patients identified, 27 (18.1%) were	Patients with high SVI have higher rates of	Of 149 esophagectomy patients identified, 27 (18.1%) were	In general patients with high SVI have higher rates of	Devoting more resources to patients with high SVI	The effect SVI on esophagectomy outcomes	Health Condition (Post-Operative Morbidity	0	0	0	1	0	//	1	1	0	1	0
7	5 (common)		1	1	0	To determine the association between social	This cohort study analyzed 2 county-level social	From 2016 to 2020, there were a total of 222 018 suicides in	This cohort study found that social vulnerability had a direct	All IRRs for both the SVI and SVM were statistically	more likely to be at risk of adult suicide.	Our results provide a measurable approach to reducing	Policy makers can use the correlation between SVI	Health Condition (Social Vulnerability and Risk of Social	0	1	0	0	0	//	1	1	0	0	0
8	6 (common)		1	1	0	The Metropolitan Atlanta Developmental	2018 data from CDC's Social Vulnerability	We found that overall prevalence was higher in areas of	Linking ASD prevalence to SVI metrics can	ASD prevalence was higher in areas with	Using these indicators, we found that ASD	Linking SVI information to public health surveillance	The study highlights the value of linking SVI data with	Vulnerability and Prevalence of Autism	0	0	0	0	0	//	1	1	0	0	0
9	7		1	1	0	Enhanced	This was a	773 of 1191	Higher social	773 of 1191	more likely	A	Policy	Health	0	0	0	0	0	//	1	1	0	0	0

Figure: Extraction Tool

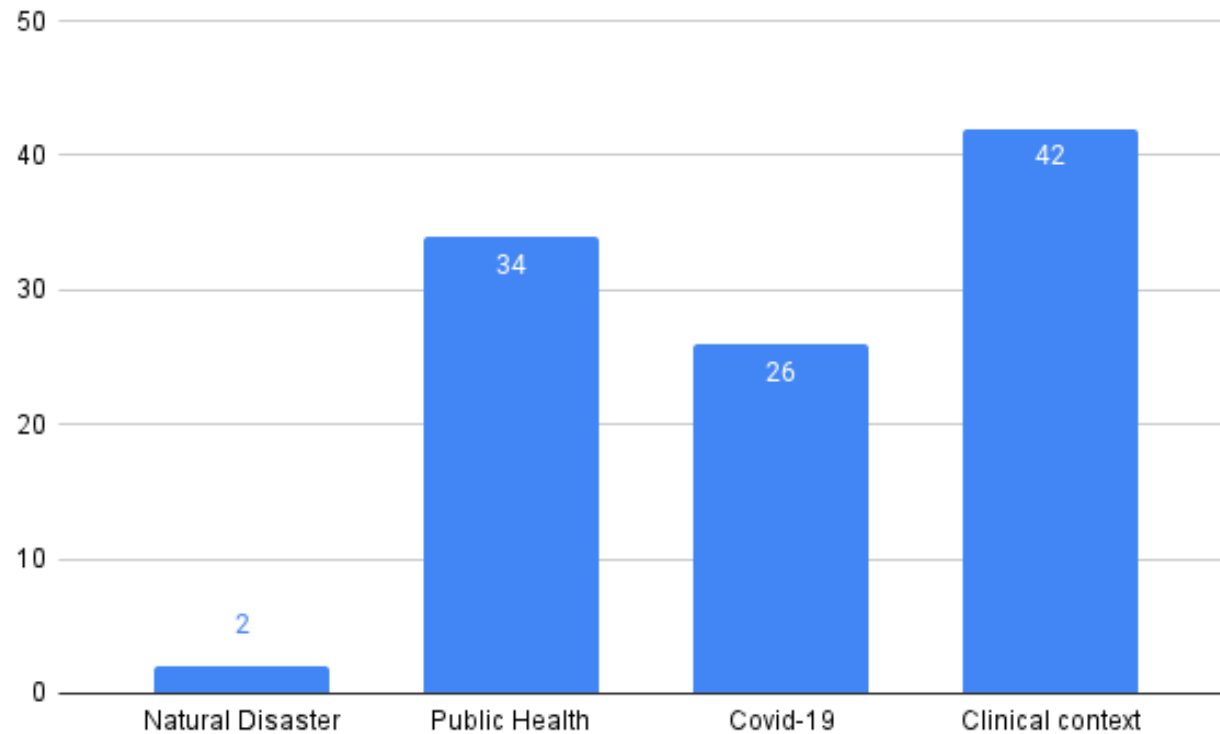
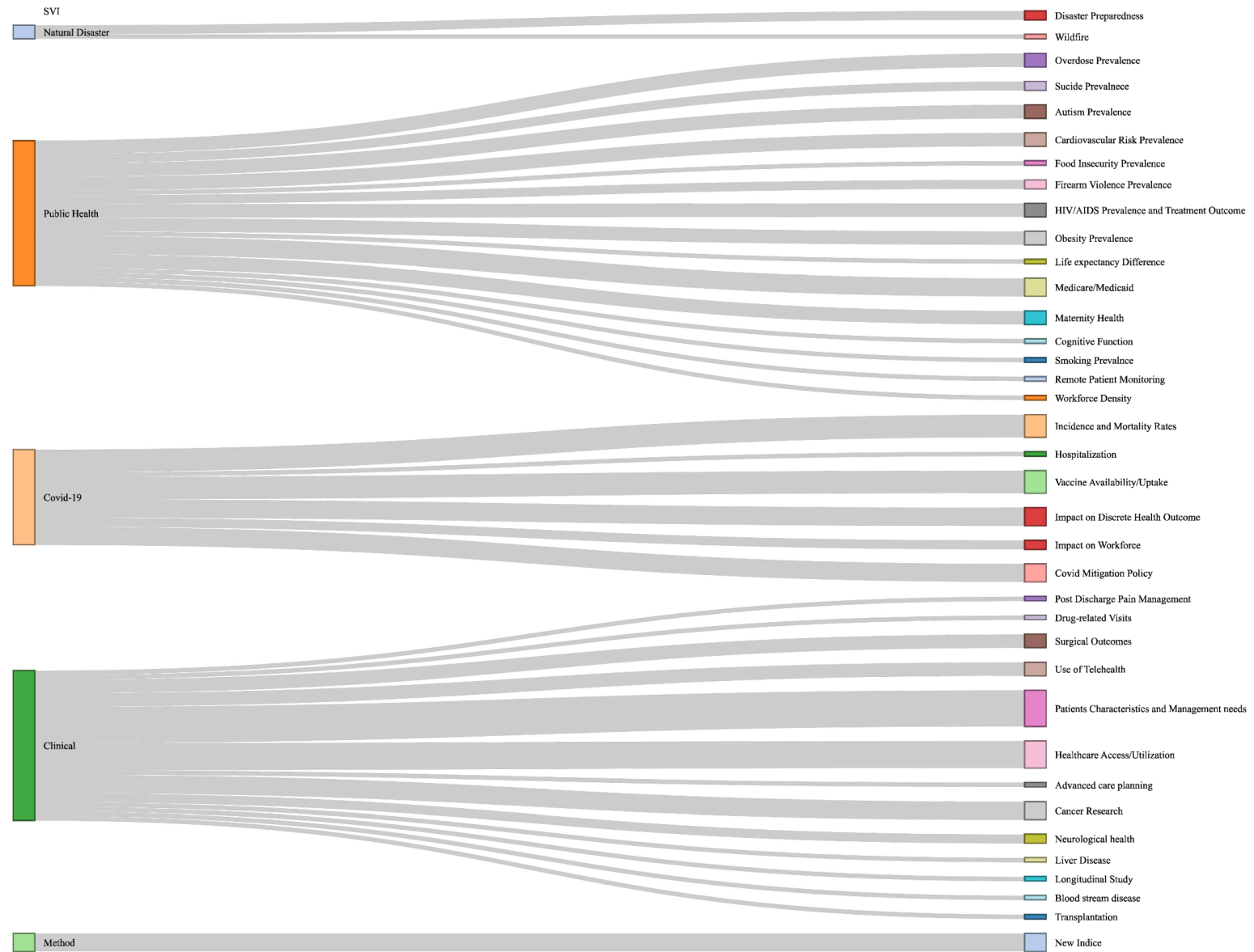


Figure: Area of Usage of CDC SVI

What is CDC/ATSDR Social Vulnerability Index?

ATSDR's Geospatial Research, Analysis, & Services Program (GRASP) created the Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry Social Vulnerability Index (CDC/ATSDR SVI or simply SVI, hereafter) to help public health officials and emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event.



Research Aim 2:

Where should threshold be placed along the continuous scale 0-1 within the SVI in order to separate worst-off groups and prioritize various interventions effectively. We, therefore, conducted a comprehensive review to identify various thresholds that have been used to separate worse-off and best-off populations (Personal)

Operationalization: Define and measure concepts precisely, making them observable and quantifiable for research and analysis.

Result

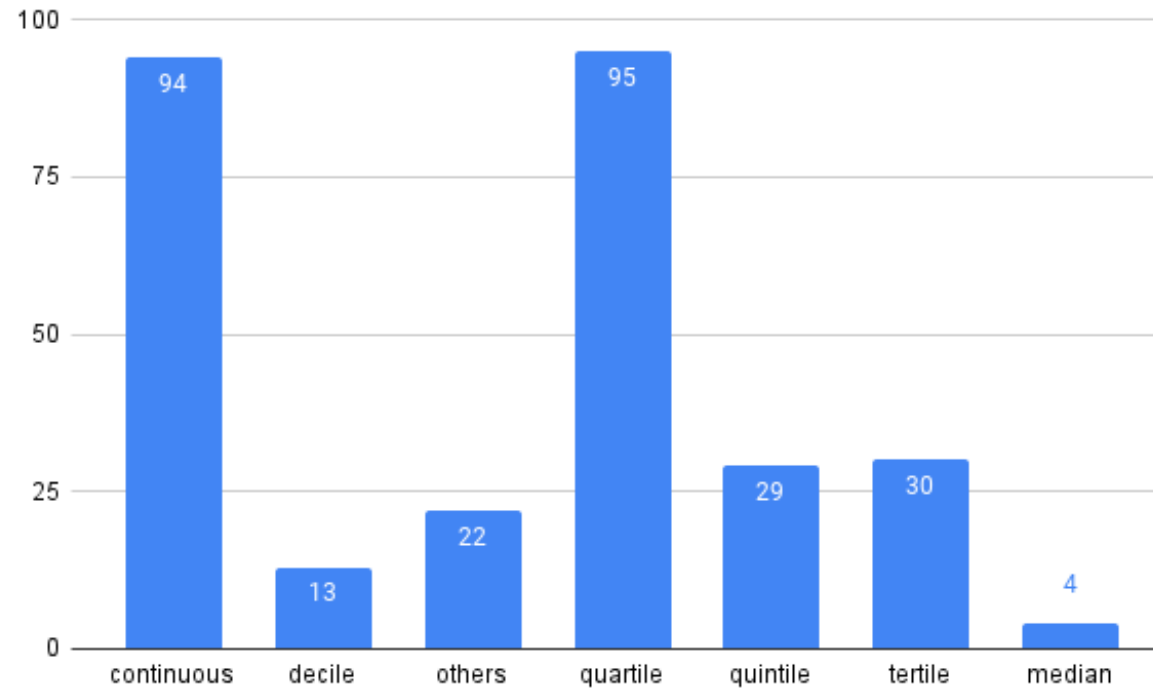


Figure: Cut-off points in CDC SVI literature

Lessons learnt & Key takeaways

- Advocacy for equity
- Policy work
- Interest in research
- Qualitative data extraction skill
- Drafting manuscript

Future Directions

Reflections Accompanying a Report on
**Addressing Social Drivers of Health:
Evaluating Area-level Indices¹**

A new report from RAND commissioned by ASPE assesses existing area-level indices of social determinants of health and their potential use in health care payments

Steven Sheingold, Rachael Zuckerman, Cinthya Alberto, Lok Samson, Euny Lee, Victoria Aysola

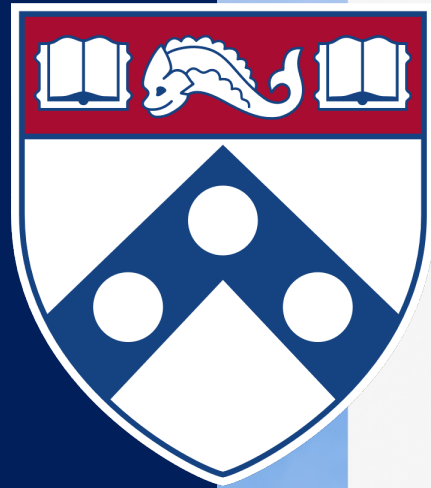
- The purpose of the RAND report, commissioned by ASPE, is to evaluate different area-level indices of social determinants of health (SDOH) for potential use in determining health care payments.
- They are keen to using indices for HRSN, but also haven't yet thought about the cut point issue
- Website with centralized information
- Thesis (Maybe)

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