Arch Trauma Emerg Med. 2025;1(1):16–21.

Archives of Trauma and Emergency Medicine Commentary

Syndemics: A Community Health Needs Assessment Blindspot

Chris Caulkins[1,*]

[1]Caulkins Consulting, LLC, Forest Lake, MN, USA

[*]Correspondence should be addressed to Chris Caulkins, c.caulkins@freerangethinker.org

Received date: July 28, 2025, **Accepted date:** December 29, 2025

Citation: Caulkins C. Syndemics: A Community Health Needs Assessment Blindspot. Arch Trauma Emerg Med. 2025;1(1):16–21.

Abstract

The purpose of this study is to perform an analysis of 51 community health needs assessments (CHNAs) qualitatively and quantitatively (mixed methods) for evidence of the presence or lack of the identification of syndemics, which is defined as two or more physiological conditions, exacerbated by a cultural factor that gives rise to a health problem. This research uses a book chapter titled, Suicide as Syndemic—physiological effects of high altitude and physiological and behavioral manifestations of mental illness, exacerbated by the Cowboy Culture as a referent. Cowboy culture is a pervasive ethos influencing community members through characteristics like independence, stoicism, and a potential for recklessness, often contributing to social isolation and a reluctance to address psychological distress. The 51 reports were uploaded into a qualitative analysis software package for coding and sorting, with the findings recorded in a spreadsheet, which was then uploaded to a quantitative statistical package. Descriptive and inferential statistics (chi-square and binomial tests of proportions) reveal no syndemics mentioned or accounted for within the reports. Furthermore, consideration of culture and weather/climate was underrepresented. The authors addressed suicide in 47 (92.2%) of the reports. Mental illness was predominantly linked to suicide; however, it was Kraepelinized with cultural and other systemic factors significantly lacking in consideration.

Keywords: Syndemic, Community Health Needs Assessment, Suicide, Suicidality, Social Determinants of Health

Introduction

Syndemics two or more physiological conditions exacerbated by a cultural factor—that result in an adverse health outcome [1], are neglected phenomena in the identification of suicide-prone communities.

In writing *Suicide as Syndemic* in *Suicide Risk Assessment and Prevention* [2], I describe a method of detecting a syndemic—the anthropsy—to study suicide in Park County, Wyoming. The anthropsy reveals a syndemic—the physiological effects of high altitude and brain chemistry of mental illness on the body, with the pervasive cowboy culture amplifying those physiological conditions, which increase the suicide rate. Reason's [3] Swiss Cheese model was used to frame the syndemic, which lends itself to root analysis and a view of suicide in the context of a greater system.

The conceptual view of psychological pain (psychache) has evolved as something that may be the outcome of a mental illness, but also something potentially present in the absence of diagnosable mental illness. As such, this model of a suicide syndemic should be reframed as psychological pain and the effect of altitude exacerbated by cowboy culture. Psychache is a term coined by Edwin Shneidman [4], defined as an unbearable psychological pain. As such, psychache is a more encompassing and accurate depiction of the phenomenon of suicide that withstands the human tendency to medicalize human emotions. This phenomenon is known as Kraeplinization, after Dr. Emil Kraepelin, who is viewed by many as having oversimplified psychology by ignoring factors outside of disease processes [5].

In the ensuing years since publication, one cannot help but wonder what progress has been made in uncovering syndemics. Knowledge that a syndemic is in action assists in the development of public health interventions to mitigate suicide rates.

At the population level, healthcare organizations are required to conduct a community health needs assessment (CHNA) every three years for the area they serve [6]. Local, state,

and tribal public health departments may complete a CHNA voluntarily or because it is a state law or requirement of an accreditation process. The CHNA would be an ideal method in the detection of syndemics involving suicide, cancers, sexually transmitted diseases, or many other public health problems.

The research question at hand is, do current CHNAs directly consider the possibility of a syndemic? The working hypothesis is that this phenomenon is not recognized in the sample (*n* = 51) of CHNAs. In other words, there is no direct connection between two or more physiological conditions exacerbated by a cultural factor.

Methods

The following design, collection, sampling, and analysis methods were utilized in this study.

Research design

This study employed a mixed-methods approach to explore the question qualitatively and quantitatively. The qualitative analysis enabled the identification of themes and trends, while the quantitative analysis examined the prevalence and significance of these findings.

Data collection and sample

An internet search was conducted for the publicly available CHNA. The most recent CHNA reports for the capital area of each U.S. state, as well as one for Washington, D.C., a total of 51, were downloaded. All 51 documents were uploaded to the Taguette, a qualitative analysis program.

State capitals were chosen because they are home to the largest population of the state or are the political center of gravity. Either or both qualities would likely increase the odds of a syndemic being identified or searched for.

A state-level CHNA was used for Maine, as that state collaborates with hospitals, so there is no individual report covering the capital city.

Data analysis

The data were subjected to both qualitative and quantitative analysis.

Qualitative analysis: "Culture," "Epidemic," "Suicide," "Syndemic," and "Weather/Climate" codes were established in Taguette (**Table 1**).

A search (find feature) was run on each document for the coded words, which were then tagged for aggregate analysis. Wildcard terms were used to ensure no variation of a word would escape notice (e.g., "cultur," "demic," or "suic").

These findings were coded accordingly. Once the initial coding was complete, the 47 reports mentioning suicide were reanalyzed with "Kraeplinized," "Mental Illness," "Psychache," and "Social Determinants of Health" established as secondary codes and tagged accordingly.

Each CHNA was manually reviewed to identify words and concepts that differed from those with the same meaning.

Following the Taguette coding and query, data were recorded on an Excel spreadsheet and imported into Statistical Package for the Social Sciences (SPSS) version 30 for descriptive analysis. The Gemini advanced large language model [7] was utilized as a secondary tool to verify the findings. The human researcher then manually compared the results, determined whether discrepancies identified were valid, and resolved any discrepancies for the final draft.

Quantitative analysis: Following thematic analysis, data were recorded on an Excel spreadsheet and imported into SPSS version 30 for descriptive and inferential analysis. A series of chi-square and one and two-tailed binomial tests were performed. Descriptive and inferential data were then analyzed using the Gemini advanced large language model [7] to confirm the results and verify data accuracy. The human researcher compared the outputs from Excel, SPSS, and Gemini to resolve discrepancies and ensure the accuracy of final reporting.

Results

Syndemic framework

The word "syndemic" appears zero times in the CHNA reports and is neither described directly nor indirectly (*N* = 51, *n* = 0, 0%). "Epidemic," a syntactically similar yet hermeneutically different term, appeared 17 (33.3%) times and was absent in 34 (66.7%) reports (**Table 1**). This term was included in the event "epidemic" was used in the context of "syndemic." Only one (5.9%) time was suicide referred to as an epidemic. The term "Pandemic" appeared numerous times, always in the context of the COVID-19 virus.

Suicide as syndemic components

Mental illness: Forty-one (87.2%) reports linked mental illness to suicide as a proximate cause, with depression, anxiety, and posttraumatic stress disorder (PTSD) listed as primary contributors. Six (11.8%) did not link suicide and mental illness. Four (7.8%) reports did not discuss suicide in any context (**Table 1**).

A one-tailed binomial test of proportions reveals that the observed frequency of reports linking mental illness to suicide (87%, *n* = 47) was significantly greater than the expected 75%

Table 1. Primary thematic codes for qualitative analysis (N = 51).

Primary Code	Definition	Search Terms	Present	Absent
Culture	Any mention of shared values, norms, ethnicity, race, or lifestyle, particularly in the context of health behaviors or outcomes.	Cultur*, cowboy, race, ethn*	25 (49%)	26 (51%)
Epidemic	The use of the term to describe a widespread public health issue.	*demic	17 (33.3%)	34 (66.7%)
Suicide	Any mention of suicidal ideation, attempts, or deaths.	Suic*, self-harm	47 (92.2%)	4 (7.8%)
Syndemic	The co-occurrence of two or more health conditions, exacerbated by social or environmental factors, as defined by Singer [1].	*demic	0 (0%)	51 (100%)
Weather/ Climate	Any mention of physical, non-social environmental factors that could act as physiological stressors.	environment, climate, weather, altitude, barom*, air, temper*, heat, cold	22 (43.1%)	29 (56.9%)

($p < 001$, Cohen's $h = 1.36$), indicating a very large effect size (**Supplementary Table A3**).

Supplementary Table A1 displays the frequencies and chi-square results for the linkage of mental illness to suicide in CHNAs ($n = 47$). A substantial majority of reports (87.2%, $n = 41$) linked mental illness to suicide, whereas 12.8% ($n = 6$) did not.

Regarding geographical differences, a chi-square test for independence revealed no statistically significant association between the linkage of mental illness to suicide and a state's Suicide Belt status, X^2 (1) = 0.027, $p = .869$. The measures of association, phi ($\varphi = 0.024$) and Cramer's V ($V = 0.024$), indicated a negligible effect. This data suggests that reports from both Suicide Belt and Non-Belt states overwhelmingly linked mental illness to suicide at similar rates.

Furthermore, there was no statistically significant association between the linkage of mental illness to suicide and geographical region, X^2 (3) = 0.324, $p = .955$. Cramer's V ($V = 0.083$) indicated a negligible effect. This result implies that the high prevalence of linking mental illness to suicide was consistent across all four major U.S. regions.

Psychache: The terms "psychological pain" and "psychache" were not used in any of the reports. However, it was mentioned by proxy in five (10.6%) of reports using terminology such as "sadness of hopelessness," despair," "bullied," or "mental distress" (**Table 2**).

If the definition of psychache is broadened to include mental illness, psychache climbs to being linked to suicide 42 (89.4%) of the time, which is an increase of one over the mental illness count.

Table 2. Secondary thematic codes for qualitative analysis (N = 47).

Secondary Code	Definition	Criteria	Present	Absent
Kraeplinized	The erroneous classification of a phenomenon, like suicide, solely medical.	Any statement that portrays suicide as solely a medical problem.	43 (91.5%)	4 (8.5%)
Mental Illness	A condition diagnosable using the DSM-5-TR.	Any statement that directly links suicide to mental illness.	41 (87.2%)	6 (1.3%)
Psychache	Psychological pain that may become unbearable.	Bullying, hopelessness, isolation, despair, loneliness, or any other non-mental illness condition associated with suicide.	5 (10.6%)	42 (89.4%)
Social Determinants of Health	Economic and social conditions that influence health.	Socioeconomic status, social standing relating to race, ethnicity, education, employment, etc., is linked to suicide.	3 (6.4%)	44 (93.6%)

Note. Four reports have no mention of suicide in any context.

Weather/Climate: Only one (2%) report linked weather or climate (excessive heat) to suicide. Forty-six (90.2%) did not connect the physical environment to suicide (**Table 1**). The key environmental stressor in the Intermountain West, altitude, was mentioned zero times in any context, including outside of suicide ($N = 51$, $n = 0$, 0%).

A two-tailed binomial test of proportions reveals that the observed frequency of reports linking weather or climate to suicide (2%, $n = 1$) was significantly lower than the expected 50% ($p < .001$, Cohen's $h = 1.39$), indicating a very large effect size (**Table 3**).

Supplementary Table A2 presents the frequencies and chi-square results for the linkage of weather and climate to suicide in CHNAs ($n = 47$). Overall, environmental factors were very rarely linked to suicide; only 2.1% ($n = 1$) of reports explicitly made this connection, while 97.9% ($n = 46$) did not.

A chi-square test for independence indicated no statistically significant association between the linkage of weather/climate to suicide and a state's Suicide Belt status, X^2 (1) = 0.242, p = .623. The association, as measured by phi (φ = -0.072) and Cramer's V (V = 0.072), was negligible. This data suggests that reports from states within the Suicide Belt and those outside it were equally unlikely to connect weather/climate to suicide.

Similarly, there was no statistically significant association between the linkage of weather/climate to suicide and geographical region, X^2 (3) = 3.344, $p = .342$. The measure of association, Cramer's V (V = 0.267), indicated a weak effect. This finding suggests that the low mention of weather/climate in relation to suicide did not significantly differ across the Midwest, Northeast, South, or West regions.

Culture: Eighteen (35.3%) for $N = 47$ reports linked cultural factors to suicide, while 29 (56.96%) did not (**Table 1**). Among the states not mentioning suicide, 2 (50%) mentioned culture, while 2 (50%) for $N = 4$ did not.

A one-tailed binomial test of proportions indicated that the observed frequency of reports linking culture to suicide (40.3%, $n = 19$) was significantly less than the expected 75% ($p < .001$, Cohen's $h = 0.77$), indicating a medium effect size (**Supplementary Table A3**). Note that there is a difference in percentage between the percentage reported here (40.3%) and that reported in (**Table 1**) (37.3%), because the (**Table 1)** percentage is based on all 51 samples, including the four missing data points.

Supplementary Table A3 displays the frequencies and chi-square results for the linkage of culture to suicide in CHNAs ($n = 47$). Less than half of the reports (38.3%, $n = 19$) linked culture to suicide, while 61.7% ($n = 28$) did not.

A chi-square test for independence indicated no statistically significant association between the linkage of culture to suicide and a state's Suicide Belt status, X^2 (1) = 0.097, $p = .756$. The measures of association, phi (φ = -0.045) and Cramer's V (V = 0.045), indicated a negligible effect. This data suggests that reports from states within and outside the Suicide Belt addressed cultural linkages to suicide at similar rates.

Furthermore, there was no statistically significant association between the linkage of culture to suicide and geographical region, X^2 (3) = 1.562, $p = .668$. Cramer's V (V = 0.182) indicated a small effect. This result shows that the varying prevalence of linking culture to suicide did not significantly differ across the Midwest, Northeast, South, or West regions.

Table 3. Results of binomial tests for CHNA report characteristics.

Characteristic	Category	*n*	Observed Proportion	Hypothesized Proportion	*p*	Cohen's *h*
Suicide Mentioned	No	4	.08	.001	<.001*	0.50
	Yes	47	.92	.999		
Mental Illness Linked to Suicide	No	6	.13	.25	<.001*	1.23
	Yes	41	.87			
Weather/Climate Linked to Suicide	No	46	.98	.50	<.001**	1.39
	Yes	1	.02	.50		
Culture Linked to Suicide	No	29	.60	.50	<.001*	0.20
	Yes	18	.40	.50		

Note. *N* values reflect the total number of reports analyzed for each characteristic. For "Suicide Mentioned," $N = 51$. For "Mental Illness Linked to Suicide," "Weather/Climate Linked to Suicide," and "Culture Linked to Suicide," $N = 47$. *$p < .001$ for one-tailed tests. **$p < .001$ for two-tailed tests.

Social determinants of health

Social factors, also known as social determinants of health (SDH), while not necessarily the same as culture, are often closely related. Because of this potential relationship, a secondary coding for SDH was performed with two (5.9%) linking SDH to suicide (**Table 2**). A binomial test was not performed on SDH because these two SDH are reflected in the cultural analysis.

Discussion

Revisiting the syndemic framework

Culture is an overarching concept that encompasses SDH. Similarly, psychache can be inclusive of mental illness, but not limited by Kraepelinization. In terms of the CHNA, syndemic can also be defined as two or more conditions impacting health like the effects of high altitude on the body (dehydration, increased susceptibility to alcohol, impaired cognition) and the physiological and behavioral manifestations of psychache with an exacerbating cultural factor like cowboy culture, which has numerous social determinates of health attached to it.

Prevalence and patterns of suicide-related themes

The mention of suicide in CHNAs was 92.2% for $N = 51$ (**Table 1**), and the linkage of mental illness to suicide was 87.2% for $N = 47$ (**Supplementary Table A1**). Syndemic was not mentioned in any report, and epidemic appeared 17 (33.3%) times for $N = 51$ and was associated with suicide once (2.1% for $N = 47$), with the remaining mentions having to do with other health conditions (**Table 1**). This finding is not surprising, given that even the National Strategy for Suicide Prevention fails to mention syndemic [8].

Overall, most reports acknowledged suicide as an important public health problem confronting communities. The binomial test hypothesized a 75% likelihood that mental illness would be linked to suicide, given the extensive and pervasive mention of suicide in relation to mental illness in diagnosis criteria [9]. The hypothesized proportion for suicide being mentioned at all was estimated to be a 99.999% chance because suicide is a phenomenon that is known and reported everywhere. There may be an underlying political or religiously based reason for the four reports with a complete absence of the mention of suicide.

Geographical and contextual factors

Chi-Square tests comparing geographic regions and areas inside and outside the known Suicide Belt reveal no significant difference in CHNA reports among these differing areas. The states within the Suicide Belt seem no less or more aware of syndemic than their counterparts outside the Belt. The fact that not a single CHNA mentioned, identified, or expressed an awareness of syndemics is further evidence. The lack of differentiation in how syndemic components (weather/climate, culture, mental illness) were assessed is further proof. A standardized approach to CHNAs appears to fail the Suicide Belt states.

Aside from culture, weather, and climate from region to region can be markedly different, yet do not seem to factor much in the overall assessment of population health.

Limitations

A sample was taken from every state capital and Washington D.C, which are the centers of political activity, but are not always the largest population centers. Conversely, numerous rural areas are excluded because of this sample choice, which limits generalizability. This selection was not a random sampling.

It is worth noting that the qualitative components of research inherently possess a particular subjectivity. Despite the subjective tendency, measures used to mitigate this were used, including manual review, large language model for consistency check, and the mixed methods nature itself.

Future research

CHNAs are a largely untapped source of information in the literature as to how suicide is perceived, prevented, and intervened in. Future studies should explore the CHNA in relation to suicide even more deeply. This exploration should include more rural areas.

Of utmost importance is to determine why things as ubiquitous as culture, suicide, weather, and climate do not receive the weight that other factors influencing health are given. Longitudinal studies analyzing CHNA trends, comparing CHNA frameworks, and conducting interviews with CHNA authors to understand the CHNA report process would yield valuable information.

Conclusions

Syndemics are real phenomena and happen in a variety of public health contexts. Considering the health of a community as part of an interconnected system would be beneficial. A quote attributed to an unknown physician, is the basis of a paraphrased saying that "We need to find out why people are falling in the river, rather than watching them float by" [10]. The lack of syndemic recognition, systems thinking, and root cause analysis in these reports is a call to action. Dedicating a section of the CHNA to syndemic exploration and application of the Swiss Cheese model in root cause analysis is a prudent step.

The role of a syndemic of suicide is not considered in CHNAs. Systems thinking appears not to be a strength in the public health arena. The role of culture should and must be considered in evaluating a community's health. The urge to over-Kraepelinize suicide must be resisted to avoid the tendency to cite mental illness as a sole cause of suicide, to the exclusion of cultural factors, environmental conditions, and emotional states independent of mental illness.

Conflicts of Interest

The author has no conflicts of interest to report.

References

1. Singer M. Introduction to syndemics: A critical systems approach to public and community health. San Francisco: John Wiley & Sons; 2009.
2. Caulkins C. Suicide as Syndemic. In: Pompili M, Editor. Suicide Risk Assessment and Prevention. Cham: Springer International Publishing; 2023 Jan 1. pp. 31–44.
3. Reason J. Human error. Cambridge: Cambridge University Press; 1990.
4. Shneidman ES. Suicide as psychache: A clinical approach to self-destructive behavior. Northvale, NJ: Jason Aronson, Inc; 1993.
5. Decker HS. The psychiatric works of Emil Kraepelin: a many-faceted story of modern medicine. J Hist Neurosci. 2004 Sep;13(3):248–76.
6. Patient Protection and Affordable Care Act. Pub. L. No. 111-148, 124 Stat. 119 (2010) [Internet]. 2011. Available from: https://www.congress.gov/111/plaws/publ148/PLAW-111publ148.pdf.
7. Google. Gemini (July 26, 2025, 2.5 Pro version) [Large language model]. 2024. Available from: https://gemini.google.com.
8. United States Department of Health and Human Services. National strategy for suicide prevention. United States: United States Department of Health and Human Services; 2024. Available from: https://www.hhs.gov/sites/default/files/national-strategy-suicide-prevention.pdf.
9. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th ed., Text revision). United States: American Psychiatric Association; 2022. Available from: https://www.psychiatry.org/psychiatrists/practice/dsm.
10. McKinlay JB. A case for refocusing upstream: the political economy of illness. IAPHS Occasional Classics. 2019;1:1–10. Available from: https://iaphs.org/wp-content/uploads/2019/11/IAPHS-McKinlay-Article.pdf.