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THE SYNDEMIC LANDSCAPE: A NEW PARADIGM FOR MONTANA SUICIDE PREVENTION GROUNDED IN AGRICULTURAL RENEWAL

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THE SYNDEMIC LANDSCAPE: A NEW PARADIGM FOR MONTANA
SUICIDE PREVENTION GROUNDED IN AGRICULTURAL RENEWAL

By

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ABSTRACT

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The Syndemic Landscape:

A New Paradigm for Suicide Prevention Grounded in Agricultural Renewal

Chairperson: G.G. Weix

      Montana has had one of the highest suicide rates in the nation for half a century, and since 2000, it has risen almost 50%. Despite suicide's alarming persistence in the state, there has been minimal academic study of suicide or mental health specifically in Montana, so this thesis attempts to answer a few questions: Why does Montana have such a high suicide rate? Is there something culturally, historically, or socially unique about Montana that contributes to suicide? Are current prevention efforts helpful, harmful, or lacking? Could a consideration of culture and land benefit an understanding of suicide in Montana? What has caused the recent increase in rate? Employing a medical anthropology perspective, this thesis reviews Montana suicide factors and suicide prevention efforts, with particular emphasis on how local history and place might influence health—given Montanans' close ties to land. It proposes the new idea that Montana's especially high suicide in rural communities might be linked to industrial agriculture, which has had pervasive harmful effects on rural society. Finally, it offers a potential healing alternative in the form of paradigm-shifting agricultural efforts across Montana that seek to reverse the harms of industrial agriculture and instead emphasize community, healthy land, and rural vitality.

My home is in me

Like the smell of cold

Lake water in my skin,

My lungs

Wherever I go.

Wherever I go,

My grandfather's hands,

Plum colored and strong,

Are touching mine.

--Jennifer Greene
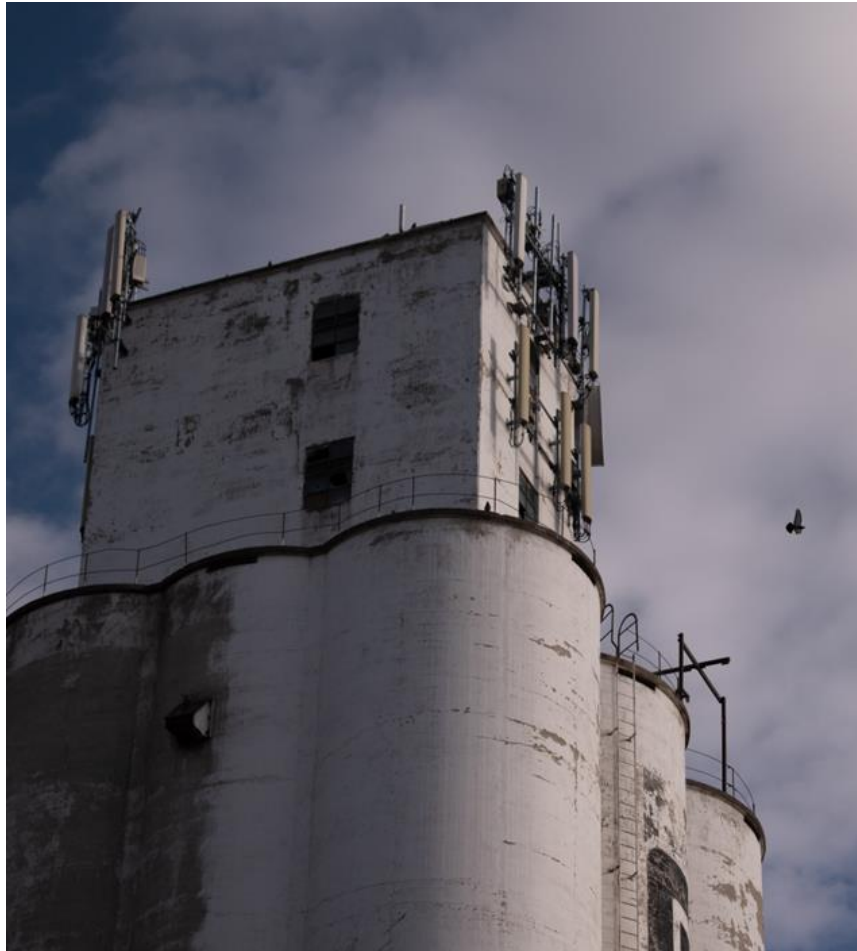
Acknowledgements

Writing of this thesis has been a long, roundabout, and convoluted process—at times overly ambitious and meandering. From the beginning, my advisor and chair, G.G. Weix, has been supportive and indispensable. I am grateful for her wisdom and guiding hand as I struggled to thread together the eclectic methods and theories of the thesis into coherent, meaningful arguments. In addition, my committee members, Gregory Campbell and Gil Quintero, were helpful in providing some of the foundational concepts of this work and in contributing valuable feedback to drafts. I also want to thank those I interviewed for being open and engaged with my often jumbled ideas and in offering crucial insight into the complicated issues I researched. Finally, I thank friends and family for their warm and joyous support.

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INTRODUCTION

> *"We must learn to revere and care for the world and one another if we mean to end up with anything of any value at all."*

> --William Kittredge

> *"We are feeding the world in the face of all hardship: the latchstring is always out. Our investment in this image of independence and generosity is visceral. The truth is more complex, however, and not nearly as popular. Farming and ranching is a business, and people living in the wide-open West are just as concerned with turning a profit, making a living and raising their kids as any other group is. It's always been that way. Where the romantic idea of cowboy life paid off was the point at which it set us apart from other businesses: we didn't have to make a profit to be doing a good job—we were in it for deeper, more soul-sustaining reasons, life freedom and autonomy."*

> --Judy Blunt

Beneath the natural gleam of Montana's landscape and the rapid growth of its western cities, the state is in crisis. Suicide, which has been nation-high for decades, is on the rise and has become an epidemic—especially in rural agricultural communities.[1] Agricultural producers, the backbone of Montana's many rural communities, face minimal or absent profits, unpredictable climate, and a system designed to benefit corporations. However, the outlook is not all negative. Scholars, professionals, and community members in mental health and agriculture are proposing paradigm-shifting ideas that promise to reshape the state toward a brighter, healthier, and more equitable future. This thesis, using a syndemic framework that is grounded in place—called the syndemic landscape—attempts to link mental health, environmental, historical, and agricultural thought by demonstrating that industrial agriculture has produced cascading negative effects in rural communities and landscapes that directly impact mental health and thus, suicide. Ultimately, I argue that a substantial shift in agricultural structure and mindset might result in increased wellbeing, reinvigoration of rural communities, and a related reduction in suicide.

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[1] While some of rural Montana (Custer, Rosebud, Park, Roosevelt, Musselshell) has some of the highest rates, many in the north central/Hi-Line area (Hill, Valley, Teton, Fergus) have some of the lowest. These differences would be interesting sites for future study. Overall though, rural suicide is higher than urban in Montana (MDPHHS data).

In Chapter 1, I detail my theoretical framework, the syndemic landscape, which is interdisciplinary and centered on the medical anthropology concept of syndemics, which describes situations where diseases cluster and interact with one another and harmful societal conditions. I combine syndemics with a series of concepts that are attuned to the influence of the landscape and history on culture and health—which I argue is essential to understanding Montana. Finally, I turn to cultural heritage theory and Indigenous health research to assert that changes in culturally significant occupations might have negative health effects, thus necessitating 'heritage' loss or disruption as a component in a syndemic.

To see the link between agriculture and mental health, we first need to understand why Montana has such a high suicide rate. The Montana Department of Public Health and Human Services (MDPHHS) provides eight factors as explanation for the state's historically high rate, citing social, environmental, and psychological causes. Chapter 2 reviews recent literature on each of these factors through the syndemic landscape; this framework is attuned to how multiple factors not only co-exist—like the MDPHHS model—but how they interact and exacerbate one another in unique and specific landscapes. By recognizing the unique influences of place and history on health, this localized perspective on suicide provides an alternate, grounded view of mental health in Montana.

As a state with limited resources and a vast geographical area, Montana lacks easy access to mental treatment in many parts of the state. In Chapter 3, I analyze Montana's current suicide prevention and mental health treatment efforts, with insight from three current professionals. I then pose theoretical and moral questions about the current focus of prevention, which is crisis-centered, and conclude with a proposal to employ syndemic intervention in mental health.

With the role of land in mental health established, the relevance of agriculture follows naturally, and is discussed in Chapter 4. This relevance is starkly clear in the devastating, well-documented effects of industrial agriculture on rural farming communities, which cover Montana. Spurred by investment and government policy, industrial agriculture is marked by consolidation of holdings, massive use of mechanization and chemical inputs (with subsequent environmental detriment), and corporate control of research, processing, marketing, and profit. The traits of industrial agriculture have resulted in rural outmigration; those remaining experience great mental strain as they face greater workload, more isolation, and reduced community resources. Physical health is affected by a reliance on unhealthy processed food, environmental damage from fertilizer runoff, and pesticide exposure. The ubiquitous social, environmental, and health effects of industrial agriculture in rural communities slot easily in the syndemic landscape framework; using it, I describe a rural agricultural syndemic in which body, mind, and land are all detrimentally impacted.

Though farmers often feel powerless in this system, some offer fruitful alternatives that counteract industrial agriculture's negative effects and work towards a better future. In Chapter 5, I overview several efforts to reform agriculture—primarily focusing on alternative thinkers that intentionally seek to return value to local communities, and which prioritize sustainability over production. Overall, there are several feasible and well-evidenced steps that Montana agriculture can take that will benefit the health and wellbeing of Montanans.

Transforming the foundational system of production is a monumental task, especially when it is tied to global commerce, vested in corporate interest and lobbying, and founded in decades of practice. But Montana needs a change, and cultural narratives may offer the inspiration and impetus for it. Not the well-worn cowboy myth, however, nor that of the resilient

homesteader—those narratives have contributed to the stigma and isolation that hangs over suicide in Montana—but those alternative narratives: of Indigenous Montanans, women, and outside voices in literature and history who have paved the way with the sort of community-centered pathways, like de-stigmatization and regenerative organic, that Montanans can follow in their pursuit of flourishing communities amidst the perils and uncertainties of the 21st century.

Why Suicide?

Montana has had a nation-high rate of suicide for decades. In the last twenty years, the rate has risen almost 50%, an alarming trend (CDC). Though only about 300 individuals die by suicide each year in the state, the actual footprint of suffering of suicide is much larger. First, there are approximately 25 suicide attempts for every suicide death—ballooning the number of individuals who are at critical points of despair and underscoring the breadth of suffering in Montana (Rosston 2021). Second, the impact of a suicide death goes beyond the victim or their immediate family, but it is estimated that around 135 people are affected in some way by a suicide death (Cerel et. al 2018). This sobering statistic is made real by recurring groups of suicides around Montana—most recently in Lake County, which experienced multiple student suicides in 2021 (Rosston 2021). In essence, I argue that suicide rate is an indicator of overall societal disfunction and must be attended to in order to improve wellbeing in Montana.

Why Agriculture?

Similar to suicide, agriculture plays a relatively small role economically. However, I argue that agriculture is important for two reasons. First, I follow Goldschmidt (1978, xl), who asserts that the "most important single factor in the formulation of the character of nations is its basic mode of production and the way that production is organized." Agriculture is central to the

way that we relate to the land and produces the food that is essential to our survival, so its impact goes beyond what economics would suggest. Second, agriculture is inextricably tied to Montana's identity. From the open range cowboy to the 1910s homesteader, agriculture still plays a central role in the stories and narratives that influence Montana culture, even today (Egan 2003).[2]

Defining Health

Because this thesis seeks to aid in efforts to improve health, it is essential to define this frequently used, but broad and vague term. In defining health, it is important to strike a balance between an ideal overall standard of health and consideration for local context. McCartney et. al (2019, 26), in a review of health definitions, settled on health as "a structural, functional and emotional state that is compatible with effective life as an individual and as a member of society." This definition is cognizant of the multi-faceted nature of health and of health's role in allowing individuals to perform duties necessary to living socially. Incorporating the effect of land and environment on health, Last's (2007) definition is a useful addition: "a sustainable state of equilibrium or harmony between humans and their physical, biological and social environments that enables them to coexist indefinitely." The inclusion of indefinitely is critical for this thesis as it looks to sustainable practices to improve societal and individual health.

Methods

In a suicidology field that is dominated by the use of biomedical data and survey statistics, I employ qualitative research as a way to provide a culturally-grounded and humanistic

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[2] See, *Yellowstone*.

view of suicide. This is a deliberate shift in paradigm that aims to provide alternate perspectives that better inform suicide prevention approaches.

As an interdisciplinary study, the bulk of this thesis is a comprehensive review and synthesis of scholarship from suicidology, cultural heritage, environmental science, medical anthropology, and literary criticism. This secondary research is supplemented with oral interviews of prominent figures in agriculture, cultural heritage, literature, and public health in order to obtain a broad, up-to-date portrait of current issues and accompanying strategies of improvement; I purposely avoided the ethical entanglements of speaking to those experiencing suicidal ideation or past attempts.[3] Rather than complete months-long ethnography of a specific place in rural Montana, I instead incorporate short ethnographic vignettes carried out in summer 2021 of the Miles City Bucking Horse Sale, as an intern with Preserve Montana doing historic preservation work in multiple contexts around the state, and of agricultural work outside of Missoula. This approach, while less detailed, provided a broad and varied portrait of rural Montana that wouldn't have been possible in a more focused study. Finally, I perform simple county-level statistical analysis of Montana suicide factors to aid in understanding of suicide at a more local level and to begin to link this qualitative research to the qualitative research that is usually employed in suicidology and suicide prevention.[4]

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[3] An IRB project was completed for the oral histories.
[4] In the thesis, and especially in the conclusion, I use 'we' rather than 'they' or 'Montanans' when referring to the state's approach to suicide prevention and community revitalization. This unconventional use of we is for two reasons: I am researching this topic not out of general interest, but because I want to enact positive social and health change; as a resident of Montana, I am personally invested in the betterment of communities in the state and the improvement of fellow Montanans' lives. This passion for relieving suffering drives the research.

Bucking Horse Sale. May 2021.

A dry, sunny, May day. Today, the small town of Miles City is bustling with dust and activity—it is the weekend of the Bucking Horse Sale. Started in 1950 as a way to auction off unbroken horses, the Bucking Horse Sale has become an important regional gathering for the rodeo and ranching community, and essential for Miles City.

This summer, thousands swarm the town in their pearl snap shirts, Wranglers, and cowboy hats for the "Cowboy Mardi Gras." Though certainly no Bourbon Street, there is a parade down Main Street the morning before the main event, complete with thrown candy—the air tinged with fresh horse manure rather than New Orleans liquor. The parade line reads like an old Yellow Pages: the funeral home, banks, myriad businesses, nearby ranches and farms, the hospital, Range Riders Museum, 4H club, the Northern Cheyenne Tribe; the whole community is out and in engaged with the BHS. In the adjacent city park, Yellowstone star Forrie J. Smith is the center of attention—it seems the show is beloved by many here. He will later be the guest of honor at the rodeo. Smith, who grew up ranching and rodeoing in Montana, looks at home with his grey handlebar and cowboy get-up, which is no different from what he wears in the show.

The entire event is covered in the claims of an "authentic west" and "real cowboys." There is a cowboy breakfast Saturday morning serving standard American fare in a cafeteria— eggs, sausage, pancakes, bacon—there is nothing particularly "cowboy" about it. Montana governor Greg Gianforte is there and mingles with supportive attendants. On Sunday, cowboy church is held. Apart from offerings collected in cowboy hats and the advertisement of a separate bible study group for ranch-hands, there is nothing "cowboy" about the service.

How much of the BHS and its attendants is authentically cowboy or western? And what do these terms actually mean? Is this weekend more of a costumed Mardi Gras than "authentic western" gathering? Yes and no, it seems. At the rodeo grounds, grandstands are packed full to watch the day's main events: saddled and bareback bronc riding, horse races, and a wild horse race. The announcer provides a brief statement about the importance of the BHS: it celebrates horse culture (though this is cow country now, he clarifies) and Eastern Montana's pride in breeding stout horses for world wars. After a grand entrance led by Forrie J. Smith and a bevy of flagbearers, the events begin. Unlike traditional rodeos, horses are auctioned off to bronc breeders as they are ridden—hence the event's name and the rapidfire auctioneer's chant over the cheers of the crowd. Results are mixed: some riders hold on for 8 seconds, others are thrown into the dirt by particularly rank horses. In a one-man microcosm of current events, a Crow bronc rider is bucked off a horse named Keystone Pipeline. After a switch to horse racing and a wild horse race where participants have to wrangle, mount, and ride an untamed horse around the track, the event returns to bronc riding—this time, a futurity sale, where breeders bid on the offspring of broncs being ridden. This seems the most important aspect of the event, as it perpetuates this culturally significant practice for the next generation.

At night, a procession of attendees makes their way downtown to dance in the street to country music and pack country bars.

CHAPTER ONE: THE SYNDEMIC LANDSCAPE

"Over time the artifacts went back to earth and the wildlife returned, nurtured and guarded by landowners who came to see the prairie as empty without them. Only stories survive, and a restlessness when wind rises on winter evenings. Every generation relearns the rules its fathers have forgotten. One rule is awareness, the need to see past the power of human hands on the land, to the power beneath it. Those who forget have the wind to jog their memory, wind slipping evenly through the sage, dusting across the fields. Watch your back, it's whispering. This land owes you nothing."

--Judy Blunt

The homesteading experience was more than just another episode in the history of failure in America. It scorched people too fiercely to be shrugged off...everyone to whom I spoke was proud of the tribulations of their grandparents, and took comfort from them, too: measured that against the baseline, life here and now could hardly fail to appear feather-bedded and secure. They shared—and I took this as the most obvious grandparental hand-me-down—a manner of gnarled circumspection.

--Johnathan Raban

Suicide is a complex biopsychosocial phenomenon with a diversity of intersecting causes; this necessitates an interdisciplinary, holistic approach to understand it. Towards this need, I have synthesized a new theoretical framework to think about suicide: the syndemic landscape. The syndemic landscape combines medical anthropology's concept of syndemics, social science's concept of the processual landscape, environmental psychology's concept of place identity and attachment, and scholarship from cultural heritage into a single interdisciplinary framework that can effectively undergird a study of suicide in Montana by illuminating upstream structural contributors to suicide, the entanglement of suicide with other health issues, and the central importance of place to Montanans' sense of self and wellbeing.

Syndemics

Originated as a framework for studying HIV/AIDS by medical anthropologist Merrill Singer (2009, xiv), syndemics is a concept that describes a "set of enmeshed and mutually enhancing health problems that, working together in a context of noxious social and physical

conditions, can significantly affect the overall disease burden and health status of a population."

Syndemics shifts the traditional focus of looking at a single, isolated disease in an individual to a

broader view, as Singer (2009, xiv) asks: "Rather than starting with the part (with this disease or

that social condition), why not look at the whole (the full array of the health and social problems

suffered by an individual or a community) and assess the nature of the interconnections among

the parts, including the intricate ways in which they promote and reinforce each other and

thereby create a complex and burdensome web of entwined health and social problems?" This

'whole' view of societal issues is useful because it better informs upstream policy measures that

can prevent downstream suffering. Syndemics, which have now been acknowledged historically,

present themselves across the disease spectrum; for example, Mendenhall (2019) compared

diabetes syndemically across the globe, illustrating the localized ways that diabetes interacts with

and is exacerbated by different diseases like HIV, cultural patterns like stigma, and economic

issues in places like Kenya, India, Chicago, and South Africa. Overall, there are three criteria to

qualify a syndemic: two or more diseases cluster together, disease interaction, and harmful social

conditions (Mendenhall et. al 2022). In this thesis, I use syndemics to describe how suicide is

exacerbated by changes in rural communities brought about by industrial agriculture, and how it

interacts with malnutrition-related obesity and chemical-caused cancer.

Processual Landscape, Place Identity, and Place Attachment

As a way to conceptualize the cultural, health-related relationship with land, I incorporate

Menatti and Casado da Rocha's (2016, 13, 1) interdisciplinary concept of processual landscape,

which defines land as a "dynamic ecological system" that carries cultural values and involves a

"continuous and co-creational" relationship between human and land. The processual landscape

is useful because it provides a causal link between health and landscape: "*We live embedded in*

landscape and…*we perceive it through our whole body, and therefore it affects our well-being*" (Ibid, 5 emphasis in original). A processual landscape is more realistic—the landscape is no longer just something to be seen and there is no more divide between biological and social. In a Montana context, where land—historical, cultural, and ecological—is central to identity and the lived experience, this concept is essential as a tool for understanding health and well-being. . Conradt (2002, 17, 56) underlines the power of the Montana climate, asserting that Montana's extreme environmental conditions have "left an indelible impression on [Montana's] collective narrative," so that the "relationship between people and environment…is the Montana story."

If the processual landscape provides a holistic bodily connection to land, environmental psychology's concepts of place identity and attachment provide a mental one. Jaicks (2022, 52-53), writing about Montana ranchers' connection to their land, describes place identity as "going beyond emotional attachment and a sense of belonging," and that the "cognitions of one's place identity represent the suite of memories, ideas, experiences, feelings, attitudes, values, preferences, meanings and conceptions of behavior defined by day-to-day existence in a given place and time." This is the sum of a person's history in an environment, grounded in specific experience. In Montana, Jaicks asserts that place identity is key to ranchers' sense of worth, which is especially relevant in contemporary Montana given the "radical and profound change that's currently reshaping rural Western landscapes," from urbanization to new extractive industry (Haggerty 2018). Place attachment is a similar concept, defined as the "emotional bonding between people and their respective meaningful environments" (Jaciks 2022, 54). Attachment can be at both an individual and group level, and is a sort of place-based cultural heritage as it describes environment-specific practice and preservation of "collective traditions, values, and beliefs" (Ibid. 55). Although these concepts are used in a variety of contexts and

scales, like wildlife conflict resolution in ranching landscapes or the connection of elderly to

geographies of childhood, this thesis is focused on the emotional relationship that rural

Montanans have to their communities, including memories of a more vibrant past and

generational history (Rubinstein and Parmelee 1992).

Cultural Heritage

Finally, I draw upon the interdisciplinary field of cultural heritage which asserts that

heritage is a "basic element of civilization" (Yu et. al 2018, 2). But first, what is heritage?

Harrison (2013, 113) asserts that it is not merely a "collection of things" like buildings, artifacts,

or monuments, but the "social 'work' that individuals and societies undertake to produce the past

in the present"; it is not entirely the domain of people, but entails interactions between people,

things, and their environment—and thus fits into the concepts of processual landscape and place

identity/attachment. It is active, dynamic, communal, and constructed (Logan 2007, 34-38;

Harrison 2013). Its performative, non-static nature necessitates practice as a component; an

unknown ancient structure may be a valuable archaeological object, but if it is not researched,

visited, or talked about, it is not heritage. To see how this might be relevant to health, I first turn

to the wisdom of Indigenous Healthcare, which incorporates traditional belief and cultural

practice as essential to wellbeing, and which focuses particularly on disruptions of heritage and

landscape as detrimental to health (McMullin 2010; Karuka 2019; O'Nell 1998; Haggerty et. al

2018). Though Western Healthcare has rightfully been maligned as being colonial and primarily

designed for white men, I challenge its universal and generalized efficacy in 'Western Society'

(Gone 2008). While I by no means imply that the dominant group in America, white people,

have suffered cultural loss and destruction like that of Indigenous Americans, I do assert that

healthcare should be attuned to cultural changes in local communities. Should not mental health

in Sidney, Montana be treated differently than in New York City? So, I argue that suicide prevention should attend to local, traditional cultural practice and heritage/landscape disruption (which is tied to place identity/attachment) as a significant contributor to mental wellbeing, and thus suicide risk. In practice, this might look like considering the emotional effects of losing a generational farm or ranch.

Tying Theory Together

Why am I adding to the already robust theory of syndemics? It is difficult to account for intangible loss of place or heritage as disease or marginalization in the current paradigm of Western health, and yet, in Montana, all signs point to place and heritage as influencing the health of individuals and communities. So, the syndemic landscape allows for intangible factors to be incorporated into a model of syndemic health. In sum, the syndemic landscape is a framework that is attuned to the structural factors that influence multiple, interacting health risks and that is firmly attuned to the influence of environment and place on both health and society. Because Montana is a state with significant health burdens and an intense connection to place, I hope that the syndemic landscape can be a productive framework for researching wellbeing in the state. In this thesis, it has certainly been a unifying concept, bringing together what are often treated as disparate fields of study and societal phenomena.

AT&T Cabin. July 2021.

Deep in the Helena National Forest in the heat of summer. It is almost like wildfire season does not happen up here. We are on a contract for the Forest Service, restoring a former AT&T corporate retreat cabin so it's usable for the USFS rental cabin program. It's a beautiful building, with unique logwork in the eaves—it just needs some work. This week, we are repairing broken windows and installing higher log railings to comply with safety regulations.

Like the schoolhouse, I wonder what the historic value of restoring this structure is. The cabin is isolated—miles of rough, washed-out roads from anything paved. We get lost trying to find it the first time. And yet, its charm is undeniable. Nestled between two babbling creeks, birdsong and butterflies are ever present. It is idyllic.

Late in the afternoon, the rev of a small engine comes around the bend—sound is more useful than vision in this dense forest. Two men in a 4x4 come into view, and walk up to the porch for a chat. They are from Basin—a small, former mining town nearby. They love to explore old cabins in the area, lamenting the poor quality of new pre-constructed builds. They are fascinated by this one, and I am glad to see someone appreciate the work. They scope out the entire property, admiring the old generator AT&T left behind and laugh with us at the outhouse's urinal. Notably, they tell us about how the USFS no longer produces maps of the region that list all of the old trails and cabin sites. The old maps will be destroyed, and are no longer available. It seems like an erasure, and the men are upset about it.

CHAPTER TWO: A REVIEW OF SUICIDE IN MONTANA

"There is a certain emptiness between the ancient years of roaming and the end of roaming, the old song and dance gone, the gods waiting for their complements. How huge this country is and how we've filled it."

--Melissa Kwasny

Introduction

Despite glossy magazines advertising Montana as a "serene escape" to an authentic

Western experience and Norman Maclean's near-holy connection to recreation in the famous *A*

River Runs Through It (1976), the state experiences grave mental health concerns (Big Sky

Journal 2021, 74; Distinctly Montana 2021). Most pressing among these is suicide; for the past

40 years, Montana has ranked in the top five nationally in suicide rate, and in the past fifteen

years has seen suicide increase to almost double the national average despite the tripling of the

Department of Public Health and Human Services' (DPHHS) budget in the same time frame

(Montana DPHHS 2020; MT OBPP).[5] In an effort to deepen understanding of phenomena

contributing to suicide in the state and relieve suffering of its residents as a result, this chapter

analyzes the factors Montana DPHHS lists as causing Montana's high suicide rate, which are:

Altitude, Vitamin D Deficiency, Poverty, High Veteran and Indigenous Population, Social

Isolation, Stigma, Healthcare Access, Substance Abuse, and Firearm Ownership (MT DPHHS

2021). These factors are significantly gendered male and heightened in rural areas, so this

chapter will focus on rural men. Due to the converging risk factors, Montana has been dubbed

both "ideal" and a "perfect storm" for suicide, reinforcing the necessity of research in the state

(Zolnikov 2019; Rosston 2021).

Though suicide is well studied, suicide in Montana is not. In an effort to provide a

baseline of understanding for further Montana suicide research, I first review current scholarship

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[5] A 35% increase in rate for Montana.

on each suicide factor and prevailing treatment recommendations, with a particular focus on salutogenic, or positive health, policy. Then, to situate each factor in contemporary Montana, I briefly consider the factor in local context. Overall, this section is the first step in answering the call for more research specific to rural life, geography, and local variation (Nock et. al 2008; Steelesmith et. al 2019; Opoliner et. al 2014; Stone et. al 2018; Mohatt et. al 2021; Hirsch and Cukrowicz 2014). To conclude, I demonstrate how these factors might be considered simultaneously through a syndemic landscape approach.

Theoretical Background

Although the Montana DPHHS already incorporates a biopsychosocial perspective in its listed suicide factors, I argue that attending to cultural and historical forces will provide a more complete view of suicide; culture and history—and the volatile changes involved therein—are especially relevant when considering the state's recent rise in suicide. In addition to the syndemic landscape, I utilize the Three-step Theory, which is a productive framework and provides a useful organizational structure for analysis and policy focus. It outlines that individuals "first must experience a combination of pain (typically psychological) and hopelessness in order for suicidal ideation to occur. Second, for those meeting the first set of criteria, a lack of connectedness allows ideation to escalate …The third step from ideation to attempt is propelled by what the theory describes as *capacity* to attempt suicide, which is made up of dispositional, acquired and practical factors" (Allchin et. al 2018, 44, emphasis in original). Each DPHHS suicide factor slots into the three-step process, and reflects different approaches to combatting suicide.
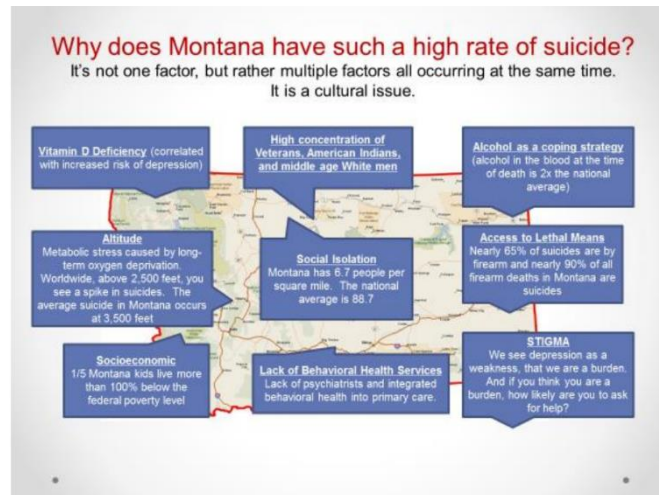
Figure 1: MDPHHS diagram of suicide factors.

Literature Review of Established Factors

Step 1: Mental Pain (Altitude, Vitamin D, Poverty, Native, Veteran)

Altitude

The Montana DPHHS reports altitudes above 2,500 feet as contributing to increased suicide rates due to metabolic stress caused by oxygen deprivation, making it an important factor in the first step of the Three-Step Theory (Rosston 2021). In the past decade, several studies have assessed this phenomenon, to somewhat ambiguous conclusions; this is primarily due to an unexplained causal relationship. Many studies focus on hypoxia, or altitude-related oxygen deprivation, as producing "bioenergetic dysfunction" in those with mood disorders (Haws et. al 2019, 587; Brenner et. al 2011; Haws et. al 2009; Kanekar and Renshaw 2018). At both state and county levels, these studies found a correlation between altitude and suicide rate after controlling for variables like age, gender, race, income, and population density. There were a few interesting findings in this review: contrary to firearm studies, Kim et. al (2011) found a higher correlation for elevation and suicide than gun ownership and suicide; after excluding the Rocky Mountain region (which has both the highest elevations and suicide rates), Brenner et. al (2011) still found a correlation between altitude and suicide.

A newer study, Ha and Tu (2018) supported the altitude/suicide correlation, but found geographic variability, especially in the North and Southeast.[6] Ha and Tu do not isolate a single cause for the increased rates of suicide, and offer two explanations in addition to hypoxia: lower social connection and higher firearm ownership at higher elevations. Ultimately, they conclude that "robust pathways between altitude and suicide have yet to be established" (2018, 12). Similarly, Betz et al (2011) are not convinced that hypoxia is the correct causation. Using individual data from NVDRS, they conclude that populations at high altitudes are significantly different than those at low altitudes "with respect to multiple demographic, mental health, and suicide related characteristics" (Betz et. al 2011, 571). As a result, they challenge other studies as being limited by ecological fallacies. Finally, a study of depression among the elderly in the Himalayas found low rates of depression, suggesting that "religious outlook and social/family relationship" might inhibit depression, and thus that higher rates of suicide in US high elevation areas might be rooted in cultural factors (Ishikawa et, al 2015).[7]

This debate about causation is further complicated when migration is considered. In a 2019 study, Kious et. al found a correlation between moving from low to high elevation areas and depression and anxiety among medical students.[8] How long does it take for residents to become adapted to their new environments? Do they ever? Do residents like Indigenous Montanans or Tibetans in Ishikawa et. al's study possess genetic adaptation to high elevation from generations of living in the area? Kious et. al's assertion might be supported if out-of-state residents are disproportionately represented in suicides in Montana.

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[6] Notably, they only controlled for % smoking population, & age over 65, % African-American, and % in community associations, which aren't variables usually related to suicide.

[7] Depression and suicide are not directly linked, but depression is one of the major predictors of suicidal ideation.

[8] This study had a small proportion of students at high altitude, and they were mostly clustered in two cities.

Like any study, the accuracy of the variable upon which results are based is essential. Though altitude is fixed and unchanging, the people that live on the land are not, and methods for determining altitude vary, with troubling implications for the validity of study results. For example, Haws et. al (2009), studying at the state level, used the highest elevation in the state and the elevation of the state capital; Brenner et. al (2011), studying at the county level, used the elevation at the center of the county; Kim et. al (2011) and Ha and Tu (2018), also studying at the county level, used mean county elevation. I argue that these methods for determining elevation are inaccurate, especially in states like Montana which are geographically diverse.[9]

This review of literature on altitude-related health effects leaves a few questions unanswered: If hypoxia is the reason for higher rates of suicide, is there a certain threshold at which altitude begins to take effect? If so, does all of Montana fall under that threshold or just a portion? What method is best for determining accurate altitude? If sociocultural differences are responsible, at what levels do these differences exist? Is there a regional Rocky Mountain culture that exists across Montana, or does it just exist at the higher elevations in Western Montana? Is it a rural/urban divide?

Prevention Considerations

If hypoxia is indeed the reason for altitude-related suicide, it would be difficult to treat because altitude is a geographically fixed variable that affects the entire population over long periods of time. Because of this, there has been little offered as alternative treatment apart from Kanekar and Renshaw (2018), who have investigated hypoxia-related depression, but in the

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[9] Haws et. al's method would produce an inflated number for Montana, as the vast majority of the population lives 8,000 feet below the states' highest point of 12,799 feet; the only major cities that are located at a higher elevation than the capital of Helena are Butte and Bozeman. An analysis of center-of-county elevation also reveals inconsistency; in the most extreme example, Missoula County's geographic center is over 7000 feet, but Missoula Valley, where almost all of the population lives, is at 3232 feet. On average, the county center was 550 feet above the elevation of the county seat, which is almost always the population center of the county in MT. Mean County elevation is likely the most accurate, but is liable to inaccuracy in mountainous counties like Lincoln County, which has the lowest elevation in the state at 1804 feet, but also mountains over 7000 feet.

context of antidepressant efficacy, recommending alternative antidepressant use at high altitudes, especially for women.

Instead, we might think of the salutogenic side of altitude—landscape. Montana is renowned for its natural beauty, especially in the higher elevation western half of the state. How does the benefit of existing in and experiencing natural beauty interact with the hypothetically negative effects of altitude? Velarde et. al (2007, 200) list three positive effects of landscape: short-term recovery from stress or mental fatigue, faster physical recovery, and long-term improvement of health; they put forth the idea of "therapeutic landscapes" that "promote well-being and maintain health." In addition, how do place identity and attachment interact with elevation? From the sacred landscapes like Chief Mountain for the Blackfeet Tribe to the many cherished fishing holes across the state, there are undeniable, meaningful connections to land. Though more specific research is needed in this area, natural beauty is certainly an asset in Montana that should be taken advantage of, perhaps by promoting community outdoor recreation events as a low-cost program that does not require licensed professionals.[10]

Vitamin D Deficiency

Vitamin D is an essential nutrient for physical health and mental wellbeing (Holick and Chen 2008; Veleva et. al 2018). Around 90% of Vitamin D intake is from sunlight, so it makes sense to assume that with more sunlight, mental health will be improved, and suicide rate will be lower. However, the relationship between suicide and Vitamin D is complex and contradicts such an assumed relationship. First, studies have found conflicting results on the efficacy of Vitamin D supplements on treating depression, with some finding positive effects and others finding none (Vellekkatt and Menon 2019; Shaffer et. al 2014; Guzek et. al 2021). Results seem

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[10] This touches on the idea of syndemic interventions. See Ch. 3 for a discussion.

to be more positive with Vitamin D through sunlight rather than supplements: a randomized trial of nursing home residents in Sweden demonstrated a significant increase in Vitamin D and subjective well-being after spending time outdoors in the summer (Samefors et. Al 2020).[11]

Second, there is a link between suicide and season, with more suicides occurring in the spring and summer when it is sunnier, despite the prevalence of Seasonal Affective Disorder (SAD) in winter; this pattern has been observed since 19th Century Europe and holds true in contemporary Montana (Durkheim 1897; MDPHHS data). The seasonality of suicide raises questions: what about increased sunlight raises suicide rate? Is it biological or related to seasonal social patterns? Once again, there are conflicting conclusions. Vyssoki et. al (2014), after controlling for seasonal variance in sunshine duration and suicide, found that sun had a bimodal effect on suicide rate, increasing suicide at short time scales (0-4 days before suicide) while decreasing suicide at longer time scales (14-60 days before). They hypothesize that an effect similar to patients first going on antidepressants or coming out of depression might be at work here— "by improving motivation and, only later, mood" (Ibid, 1236; Hall and Lucke 2009). While this argument follows for the transition from winter to spring, it does not explain the sustained high levels of suicide into the summer.[12] White et. al (2015, 6), after controlling for sunlight variation, still found a relationship between seasonality and suicide, suggesting that sunlight is a proxy for seasonality; they instead recommend attending to variation in "alcohol consumption, unemployment, work/holiday patterns, family support, drug use and seasonal variation in depression and psychoses," as well as temperature. Over a century ago, Durkheim (1895) hypothesized that seasonal suicide is due to more activity in summer months, and thus more opportunity for negative life events to happen.

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[11] The fact that sunlight has a more positive effect than Vitamin D supplements suggests overlapping beneficial factors such as viewing landscapes and community interaction (Velarde et. al 2007).

[12] In addition, White et. al (2015) found no evidence of a relationship in the transition from low to high sunlight.

Prevention Considerations

It is important to remember that not every individual will be exposed to similar amounts of sunlight and relationship with landscape is essential to the quality and time of exposure to sun; closely monitored studies like Samefores et. al (2020) will be useful for better understanding this relationship in future research. And, similar to altitude, it might be useful to consider the positive effects of being in Montana's exceptional natural environment, instead of just overall exposure to Vitamin D. The brutal winters detailed in Judy Blunt's (2002) *Breaking Clean* and Ivan Doig's (1978) *This House of Sky* go hand in hand with the glittering possibility of summer, and must be attended to. Or, as the catastrophic drought of 2021 showed, the sun can be harmful when not balanced by rain (Eggert 2021).

Poverty

Poverty is closely linked to negative health outcomes; it both causes mental health problems and results from them, leading to a complex, "vicious cycle" (Mendenhall 2019; Knifton and Inglis 2020, 193; Mangalore et. al 2007). Poverty factors like overcrowding, food scarcity, and exposure to neighborhood stressors can all contribute to negative mental health by interfering with the ability to manage disorders, thus prolonging them; these factors are coupled with stigma against impoverished people and places, resulting in social isolation and reduced belongingness, which further mental problems (Weich and Lewis 1998; Burns 2015; Mangalore et. al 2007).[13] Burns (2015), seeking to uncover the causal relationship between poverty and mental health, points to inequality in particular, citing the stressful effects of social comparison

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[13] Stigma is intersectional. It is important to consider how different forms of stigma interact and compound negative mental health outcomes (Turan et. al 2019).

and the erosion of social capital as exacerbating the negative effects of poverty; this can be seen as a syndemic relationship.

Prevention Considerations

Like much of medical anthropology, scholars of poverty emphasize the need to look at structural causes, rather than "individual dysfunction", as the source of poverty (Burns 2015, 108; Knifton and Inglis 2020). Towards this theoretical shift, researchers call for a number of changes in treatment. Knifton and Inglis (2020, 195) recommend financial advice be integrated into primary care, like "how to access benefits, manage debt, access local childcare and access support for employment at the earliest stages"; they also call on psychologists to support the reinvigoration of social psychology and to publicly support progressive public policy that is linked to poverty. Through these actions, psychologists hope to prevent the fundamental causes of poverty-related mental health, rather than downstream when it is much more difficult to solve poverty as a treatment plan. In Montana, poverty is similar to the national average, but it is especially high on reservations and in many rural areas—highlighting these places as foci of study. Inequality should be attended to as well; the influx of wealthy residents in the last two decades—and during the COVID-19 pandemic—has increased inequality in much of Western Montana, pricing long-term residents out of their homes and increasing cost-of-living across the board.

Indigenous Montanans

Indigenous people experience the highest suicide rates of any ethnic group in the US, and, unlike the general US population, Native deaths by suicide occur at younger ages and more significantly among women; Native populations experience a multitude of intersecting suicide

risk factors like poverty, social isolation, healthcare access, and high levels of mental illness (Leavitt et. al 2018).[14] In addition, Indigenous Americans have experienced a unique history of cultural destruction, social defragmentation, government neglect, and trauma that still has repercussions today (Karuka 2019; Stevenson 2014; McMullin 2010; O'Nell 1998). A key site of this continued struggle is landscape, which has been controlled and changed in such a way that prevents the enactment of tradition and sustenance. For Plains tribes like the Assiniboine on the Fort Peck Reservation, the near extinction of the buffalo and the inhibition of seasonal movement both had devastating effects on cultural systems and forced dependence on the US government; in mountainous Western Montana, tribes like the Salish lost access to spiritually significant sites and the essential camas root and bitterroot due to white settler encroachment and development (Haggerty et. al 2018; Karuka 2019; O'Nell 1998). The value of these landscapes and the cultural significance imbued into them have been conceptualized as an affective ecology, which is "to explore and emphasize the importance of the emotive/emotional, sensory, and other experiential ways that humans and non-human nature 'relate'"; in Fort Peck, "this affective engagement" with buffalo "occurs through both spiritual and bodily practice and…results in actual, vital survival of both species" (Haggerty et. al 2018, 22, 25). Internationally, Crate (2021, 13) has described Sakha landscape as a "cultural keystone" central to Sakha ability to resist assimilation and continue to enact traditional practice.[15] Ultimately, culture is essential to understanding Native suicide demographics and causation, as is the syndemic landscape—which is made more complex than rural white areas due to the colonial injustices listed above.

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[14] Because of these intersecting factors, Native-ness does not exist wholly in step 1 or 2 of the Three Step Theory, but crosses into both.

[15] The Sakha are a Siberian ethnic group who are losing their ecosystem as a result of climate change.

Prevention Considerations

Many scholars have criticized the applicability of standard Western healthcare in Native contexts due to historically-based distrust of government intentions and to cultural misunderstanding (Gone 2007 & 2008; Skewes et. al 2019; Huey et. al 2014; Hancock 2016). In her ethnography of depression on the Flathead Reservation, O'Nell (1998, 13) describes the way tribal members "weave emotion, history, and contemporary identity together into a tapestry of loss and social responsibility," creating a culturally grounded concept of depression wherein there is an obligation to remember cultural loss and to transcend it; this is incompatible with DSM definitions.[16] With these obstacles in mind, how should mental health treatment and suicide prevention in Native communities be implemented? Skewes et. al (2019, 81) recommend an "effective, sustainable, culturally appealing intervention that will be led by the community partners," involve multiple levels of intervention (individual, family, community), and address health holistically. There has already been success incorporating culture by introducing bison on the Fort Peck Reservation (Haggerty et. al 2018), using hula in Hawaii (Maskarinec et. al 2015), and in Tribal Health organizations like All Nations Health (2020) in Missoula, Montana that implement culturally based care.

Krishnamurti (2020) offers another form of care—watchfulness—through the Hawaiian concept of *aloha*, as a means to counteract anonymous care and provide culturally-tailored care to those at risk of suicide. In Hawaii, where colonial entanglements complicate Indigenous health, Krishnamurti questions the viability of such a strategy given the professional standards and consistency required of healthcare. As a case study, aloha is certainly fraught with issue; it is commercialized and co-opted by tourists in a way that removes most of the original meaning of

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[16] O'Nell is skeptical of the viability of DSM-defined depression in understanding depression cross-culturally. She instead recommends using the DSM as a baseline, but to question its universality and to understand depression in each culture's own terms.

the term (and thus cultural value in healthcare). In the study, a white woman fails to use aloha as an effective tool, but a Native Hawaiian woman does, and this is informative; it is paramount that those implementing culturally-tailored healthcare are themselves fluent and knowledgeable in relevant cultural concepts. Overall, Smith-Morris et. al (2021, 364, 378) argue that "the work of dis-mantling colonial tactics and legacies is still largely ahead of us," and that treatment should be "informed by biographies and ethnographic perspectives," implement "whole-person care and community-integrated and home-based programming…entail clinical support for foodway revitalization and community-based wellness campaigns," and participate in "local struggles for land rights and self-determination." They advocate for a holistic approach to healthcare, and though that requires a challenging collaborative effort, it is what is needed to address the litany of Indigenous Montanans face.

Veterans

Similar to Indigenous people, veterans routinely experience higher suicide rates than the general population, largely because veteran characteristics intersect with suicide risks like firearm access, stigma, age, and gender (Department of Veterans Affairs, 2018a; Monteith et. al 2020).[17] Intersecting factors have been covered elsewhere in the paper, so this section will focus on traits unique to veterans that make them prone to suicide. While the VA (2018b) points to veteran protective factors like resilience or strong sense of belonging as beneficial to suicide prevention, risk factors like service-related injuries and the military-civilian transition contribute to increased Veteran suicide.

In particular, service-related injuries have challenging implications for veterans beyond physical difficulty. In a study of post-9/11 veterans, Wool (2021, 289) dubs the cultural

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[17] Similar to Native-ness, veteran status also exists at both step 1 and 2 of the Three Step Theory.

challenges of veterans, 'straight time', which is the "convergence of the normative directionality of rehabilitation and 'cure' with the aspirational futurities of heteronormativity." In simpler terms, straight time describes the great pain disabled male veterans feel at their inability to fulfill masculine gender expectations of being non-disabled and providing for a family, and the framework of therapeutic care that keeps them in this mindset; ultimately, Wool (289) concludes, straight time is "costly, frustrating, and cruel." While Wool dreams of a world that embraces alternative (disabled, queer) ways of living, is this dream realistic given the entrenched military culture and pervasive stigma (Monteith et. al 2020)?

The military-to-civilian transition is especially relevant in the US because 18 to 30 year-olds have the highest rate of suicide among veterans (VA 2018a). Though the majority of veterans transition to civilian life successfully, it can be a stressful process as they struggle to renegotiate and adjust to embedded military structures—aspects of which can linger long after discharge from service (Cooper et. al 2018). Cooper et. al (2018, 164) note that individuals unprepared for transition can experience a cultural "collision or rupture," leading to maladaptation, stress, and the according suite of negative coping strategies.

Prevention Considerations

Suicide prevention is the VA's highest priority, according to their 2018 report, which is comprehensive, detailed, and well-researched. They (2018b, 18, 26) call for a "cultural shift" where veterans "view seeking treatment as a natural and acceptable behavior"; and, theoretically, the VA wants to emphasize "systemic issues rather than individual blame." With the immense resources and research the VA is devoting to veteran suicide, there is not much to contribute through this paper; however, Roy et. al's (2017) salutogenic approach to farmer stigma might be useful with veterans by focusing on positive military traits that are useful in civilian society, like

resilience and the ability to 'get things done' (Cooper et. al 2018). In addition, it would be useful to know why Montana has such a high veteran population; is there something culturally that prompts more Montanans to enter military service? Might connection to place—and the desire to defend that place—be the culprit? More research is necessary to determine how Veteran status presents itself in Montana.

Step 2: Connectedness (Isolation, Stigma, Healthcare Access)

Social Isolation and Rurality

Social Isolation is a complex cultural factor that is essential to understanding suicide because it is relevant at both step one and two of the Three-Step Theory—psychological pain/hopelessness and lack of connectedness. As a result of this complexity, however, it is difficult to isolate to measurable, accurate variables with causal explanations.[18] For example, living alone is believed to be associated with higher isolation and loneliness, but being alone does not necessarily mean that one is isolated or lonely (Klineberg 2016). There is ample quantitative and qualitative evidence on the link between social connection/belonging and psychological, emotional, and even physical well-being across culture, age, and gender (Holt-Lunstad et. al 2015; Calati et. al 2019).[19] Rurality is closely tied to isolation, and serves as a critical nexus of factors that increase suicide risk; suicide, which is already 1.8 times higher in rural areas, has increased more rapidly in rural areas as well (Steelesmith et. al 2019). And while social isolation and rurality are generally correlated due to poverty, older population, lower population density, lack of transportation, and lack of high-speed internet, the link is complex. Henning-Smith et. al (2019) studied isolation among older adults across metropolitan,

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[18] Marital status, living alone, and population density are often used as objective measures; loneliness, alienation, and belongingness are used as subjective measures (Calati et. al 2019; Henning-Smith et. al 2019; Hirsch and Cukrowicz 2014). Both are correlated with suicidal ideation and suicide attempts.
[19] [19] There are more mixed results on gender, and women may be more susceptible to isolation.

micropolitan, and rural areas and found higher levels of isolation in urban areas in variables like family reliance, closeness to relatives, living children, companionship, and number of friends. However, micropolitan and rural residents had higher rates of no friends and feeling left out. So, while urban residents may feel more isolated overall, the sizable minority of rural residents that feel completely disconnected suggests that rural areas are "more sensitive to the impact of social deprivation than more metropolitan counties" (Steelesmith et. al 2019, 2).

Prevention Considerations

Given the lower resources, remote and dispersed population, and limited healthcare of rural areas, how should social isolation be treated? Some researchers recommend changes at the individual level. Calati et. al (2019, 665) recommend four strategies to combat loneliness: "(1) developing or improving social skills, (2) increasing social support, (3) increasing the occasions for social contacts, and (4) focusing on maladaptive social cognition." Zolnikov (2019, 1149) proposes focusing on resilience, or a "person's internal ability to endure, to move beyond the difficulties, to thrive despite life's challenges." While these appeals to personal life changes certainly align with rural, male expectations of self-sufficiency, they ignore the larger social and historical contexts of communities. Public health approaches that ignore larger contexts in favor of individual behavioral action have been criticized by multiple medical anthropologists in recent years because they tend to obscure larger structural forces and place undue pressure on patients (Nichter 2008; Yates-Doerr 2015; Mendenhall 2019). In the specific context of social isolation, the strong positive effects of support and sense of community/belonging reinforce a move towards community-based initiatives (Kutek et. al 2011).

Other researchers offer alternatives that are tailored to the unique traits of rural areas. Hirsch and Cukrowicz (2014, 1, 8) argue that health interventions should be "originated by,

implemented in, and sensitive to the needs of rural communities" and should attend to "geographic isolation and social belief systems emanating from rural communities." Henning-Smith et. al (2019, 546) mirror this sentiment, adding that programs should be aware of the changing demographics and economics of rural areas and should "seek to capitalize on the potential strengths embedded in rural social ties." A community-centered approach that is informed of local culture is more likely to succeed than one that is based on broad, nation-wide trends; Mendenhall's (2019) cross-national case studies of diabetes demonstrate the value of being attuned to the unique ways that disease emerges in different contexts. One way of incorporating rural-specific traits could be using a salutogenic approach. Rather than focusing on the negative factors contributing to higher isolation in rural communities, utilizing sense of belonging and social support—which are strengths of rural populations—would be beneficial to reducing the effect of symptoms leading to suicidal ideation, like depression (McClaren and Challis 2009; Roy et. al 2017; Kutek et. al 2011).[20]

Rural isolation is multi-faceted, and is encapsulated well in Montana literature. Blunt (2002) and Doig (1978) both reflect on the everyday loneliness of agrarian life, which is only heightened during harsh winters that impede travel and necessitate total self-reliance. This extreme isolation is sometimes mediated by strong community support and cooperation in times of need, like wildfires or medical emergencies. The balance of positive and negative aspects is reflected in Roy et. al's 2017 ethnographic study of Quebec farmers, where agrarian values like sense of belonging and social support play an important role in positive health and wellbeing (as

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[20] Social isolation and rurality are especially relevant in Montana, which has one of the lowest population densities in the US and is also one of the most rural states. This relevance is supported by initial statistical analysis of two relevant factors: population density and divorce rate. At the county level, suicide rate (1999-2016) had a small negative correlation with population density; in the 2012-2020 DPHHS data set, 25% of deaths by suicide were divorced—almost double the state's overall rate of 14%. A comparison of metro (>50k), micro (10k-50k), and rural (<10k) counties revealed higher rates of suicide (1999-2016) in micropolitan and rural counties. As indicated in the review above, measuring these factors merely scratches the surface of significance contained in isolation and rurality.

opposed to negative-health agrarian values like traditional masculine norms that limit

admittances of weakness of needing help).[21] Does such support extend to mental crises, however,

or to those who are not accepted into the strictures of rigidly traditional rural Montana? This

question will be further explored in the stigma section. It is also imperative to consider the aging

populations of rural Montana; many towns have decreasing or stagnant populations as many

young residents leave small towns for opportunity in larger cities. How does this generational

break affect mental health? And how does the dissonance between cherished memories of a place

and present lack of community in many rural areas affect wellbeing (Schweitzer 2022)?

Overall, Klinenberg (2016) criticizes most recommended policy to reduce isolation as

speculative, and calls for researchers to conduct research on the effectiveness of programs.

Stigma and Rurality

Whereas isolation is tied to the economics and geography of rurality, stigma is closely

tied to the cultural and historical norms of rural populations.[22] Stigma can significantly limit the

efficacy and engagement with mental health programs because it exacerbates the second step of

the Three Step Theory, *lack of connectedness*. If those suffering feel incapable of being

vulnerable about their mental needs with their community or feel obligated to project strength in

the face of adversity, help-seeking is less likely both from friends and the healthcare system.

This issue is significantly gendered, with males being much less likely to seek help than females

(Ewert 2021; Roy et. al 2017; Ramirez-Ferrero 2005; Alston and Kent 2008; Ni Laoire 2001).

Unlike the other factors in this paper, stigma has not been measured statistically, and research is

primarily qualitative.

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[21] McPhedran and De Leo (2013) found no higher isolation in Australian farmers than other rural males.
[22] Though outside the scope of this paper, stigma is intersectional and mental health stigma interacts with racial, cultural, and gender stigma to heighten risk (Turan et. al 2019; Knifton and Inglis 2020).

While stigma is generally prevalent among men, it is especially problematic among rural men (Ewert 2021). Alston and Kent (2008), studying Australian farmers, see stigma as resulting from patriarchal gender roles and expectations that benefit men; this role is characterized by rugged individualism, stoicism, and responsibility for family and business. While masculine roles serve men well in successful years, "it also locks them into fairly rigid subject positions" that not only hinder their willingness to seek help when in need, but also place additional social pressure on men to provide for family during economic uncertainty (Ibid, 136). This doubling of strain has devastating effects for mental health—feelings of uselessness and burdensomeness abound. In areas with long generational history in a certain field, like farming or ranching, historical pressure and obligation only adds to the burden. Ramirez-Ferrero (2008, 170) details the damning effects of modernization on farming:

"The notion of 'community' was also being altered through technology. Technological innovation has almost eliminated the need for the exchange of agricultural labor. Television has undermined the motivation for the organization of social gatherings. Competition, an integral component of the economic logic of expansion, has fueled an already strong sense of individualism— further isolating nuclear families. This competition also promotes a change in cultural values associated with land: it is being stripped of its symbolic power and its bond to kinship is loosening. Land is becoming just another commodity that can be bought and sold."[23]

As modernization adds new technology that reduces the viability of small family farms and the communities that they inhabit, "cultural ideas and practices" that support traditional patriarchal society are devalued, further undermining the foundation of rural communities, and their health (Ibid, 5).

Prevention Considerations

How should stigma, which is culturally ingrained and resistant to medical intervention, be treated (Mohatt et. al 2021)? Montana is certainly no stranger to entrenched stigma, as an

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[23] See Ch. 4 for a detailed exploration on agriculture and mental health.

individualistic ethos of self-reliance prevails (Gotz et. al 2020; Rosston 2021). Hannah Jaicks (2022b), who works on wildlife conflict reduction with Western Montana ranchers, describes a "very fearful relationship with psychology but this need for it, because they all struggle with mental health." Ewert's (2021, 5) review of suicide prevention campaigns in rural California found problematic policy; in relying on common masculine stereotypes in messaging, the campaigns reinforce the "expectation that men cultivate mastery, strength, and dominance," which perpetuates stigma. The emphasis on strength leads residents to deny themselves care in favor of those they think are more in need. In addition, the campaigns' use of mental illness terms was polarizing, and Ewert (2021) recommends less stigmatizing language. Taking a salutogenic approach, Roy et. al (2017, 1544) posit that policy should incorporate positive agrarian values, and that the "development of farm stress support should start with farming men's desire and pride in resourcefulness." While not all stigma is rooted in farming communities, a focus on endemic health traits could be very useful in creating relevant and successful mental health support. A final question: as Stevenson (2014, 85) asks, how can social stigma be removed when care is confidential and anonymous? Public health might need to look at alternatives to anonymous hotlines if stigma is truly to be removed.[24]

Healthcare Access

Healthcare access is critical to preventing those suffering psychologically from progressing to more extreme actions, like suicide (Tondo et. al 2006). It is especially important in rural areas, which have lower resources, fewer psychiatrists, and more remote populations (Mohatt et. al 2021). Particularly, primary care appears to be more relevant as a point of intervention than mental healthcare; in a review of suicides, Luoma et. al (2002) found 75% of

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[24] De-stigmatizing programs in Montana are explored in depth in Ch. 3, and the agricultural relationship to mental health is explored in Ch. 4.

those who died by suicide had seen a primary care provider in the year before their suicide, and only 33% had seen a mental health provider. Women and the elderly are more likely to be reached through primary care because of increased visitation. It is critical to note that healthcare does not provide comprehensive coverage for those thinking about suicide: a study of NVDRS data found that only half of those who died by suicide had a *known* mental health condition, "indicating that additional focus on nonmental health factors further upstream could provide important information for a public health approach" (Stone et. al 2018, 622). This factor is closely linked to stigma, as some, especially rural men, avoid talking about or seeking treatment for mental health problems.

Prevention Considerations

Health insurance parity, or mandated equal coverage and rates for physical and mental care, is another important dimension of healthcare access and is critical to increasing mental health treatment. Lang (2013) found 5% lower suicide rates in states that had enacted health insurance parity laws; notably, neither Wyoming nor Alaska, which have nation-high suicide rates, had no parity law. Montana passed a healthcare parity bill in 2017, so it will be important to monitor progress in the state.

One proposed method for increasing access in remote and low resource areas is telehealth. Although there are some concerns about its efficacy and consistency compared to face-to-face interventions, telehealth appears to be just as effective (Speyer et. al 2018; Tarlow et. al 2019). And, of course, high-speed internet is a limiting factor. One way of allaying concerns about disconnections with telehealth across geographically (and culturally) distant locations is utilizing local resources. In the wake of COVID-19, Montana has greatly increased telehealth use, which is detailed in chapter 3. Finally, we must consider what is entailed in

healthcare; is access to a crisis line or a hospital enough to address suicide? Or, should healthcare be considered more broadly and include interventions in multiple areas of life along the process to suicide attempt, and directly confront systemic contributors to suicide?

Step 3: Capacity (Firearms)

Discussion over the capacity to commit suicide is dominated by firearm studies—other methods are only mentioned in relation to firearms. In recent years, numerous suicide scholars have presented firearm ownership and access as the most important factor in regional suicide variation and consequently, suicide prevention (Opoliner et. al 2014; Mohatt et. al 2021; Stone et. al 2018; Anestis and Houtsma 2017; Allchin et. al 2017; Swanson 2015; Workman et. al 2020). Towards this end, some writers have begun questioning the prevailing paradigm of suicide prevention, which currently targets causes of suicidal ideation and focuses on "identifying and referring suicidal persons to mental health treatment and preventing reattempts" (Stone et al 2018). Numerous studies have produced data that support this shift in focus. Anestis and Houtsma (2018) conducted a comprehensive analysis of state-wide variation in suicide rate, controlling for demographic, geographic, psychopathology, and religiosity variables, and found that firearm ownership predicted statewide suicide rate and accounted for 2% unique variance between states (with 90% accounted for before firearm ownership was included).[25] Opoliner et. al (2014) similarly found an association between firearm ownership and suicide rates at both the state and county level, with an additional finding that antidepressants prescribed was not significantly associated with suicide rate.

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[25] However, like the altitude studies mentioned in the previous section, causality cannot be established.

Prevention Considerations

In a 2015 opinion piece titled "Getting Serious about Suicide", Swanson et. al cite increasing rates of suicide as a mandate to change public health's approach from *why* people commit suicide to *how*. In practice, this means focusing heavily on mostly state-level firearm regulations that would reduce access for high-risk individuals. Allchin et. al (2018) provide a detailed plan for how these regulations might be implemented through the social ecological model (SEM). At each level of the SEM, the goal is increased control over the *capacity* to attempt suicide; methods range from safe storage and family accountability to voluntary self-prohibition and extreme risk laws that would require at-risk individuals to relinquish firearms and prohibit purchase of new firearms while the protection order is active. A systemic review of research gaps by mostly VA-affiliated mental health professionals revealed lethal means safety interventions as the highest priority for suicide prevention, further illustrating public health's emphasis on firearms as means to reduce deaths by suicide (Workman et. al 2020). It is important to consider two assumptions that firearm regulation is based upon: replacement (the idea that, with guns removed, replacement methods of suicide will be less lethal) and impulsivity (that most suicides are impulsive actions in moments of desperation). While Anestis and Houtsma (2018) have demonstrated that replacement methods are less lethal than firearms, the role of impulsivity in suicide attempts is still up for debate. While these proposals will likely save lives, are they politically possible? In Montana, where the ubiquity of guns is tied to occupational needs and harsh environments, and many are politically opposed to gun control, the outcome appears bleak (Larson 2021).

The studies cited here chose to use firearm ownership, rather than firearm suicide rate, to measure the influence of firearms on suicide rate. While this approach makes sense from a

prevention standpoint, are the two measurements directly related? If not, then the relationship between firearm ownership and suicide might not be so clear cut, as it would mean that the frequency at which people use firearms in suicide might be regionally variable.[26]

Ultimately, firearm studies are not interested in *why* people die by suicide, but that the chance of death significantly increases when a gun is used in a suicide attempt; so, at the center of efforts of suicide prevention is a question about the ethics of public health. Is it public health's role to decrease the total number of deaths in a population, or is its role to improve living conditions so that people are less likely to attempt suicide in the first place? Is it both? After all, if you take away the firearm, the person is still suffering enough to seriously consider death; the role of impulsivity is paramount here—if most suicides *are* impulsive actions, then removing firearms in moments of desperation is an effective approach to reducing unnecessary death and eventually, contributing to overall quality of life; if *not*, then firearm regulations are doing little to relieve extreme suffering, effectively forming a sort of anonymous care. Developed by Stevenson (2014, 104-105, 86), anonymous care characterizes a governmental "regime of life" that is "primarily concerned with the maintenance of life itself, and is directed at populations rather than individuals," so that *who* is cared for matters little—just that they are living; this anonymity prevents individual bonds from forming, changing the "ethical landscape of our social programs."[27]

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[26] When male and female rates of suicide by firearm are averaged since 2010, Montana's highest year ranks 48th, while Southeastern states make up eight of the ten highest years. Interestingly, no Southeastern states rank in the top ten nationally in suicide rate, and Louisiana ranks in the bottom 50%. This comparison further demonstrates that while firearm ownership and the rate of suicides by firearm are related, a high firearm ownership rate does not directly translate into higher usage of firearms in suicide, which casts doubt on the accuracy of firearm ownership for predicting suicide rate. Instead, cultural conclusions might be fruitful as a source of causality; Alaska, Wyoming, and Montana are demographically, geographically, and culturally similar states, so their shared high rates of firearm ownership and suicide could be due to these other shared traits as much as to increased firearm access. The gendered difference is also important to consider, and highlights male suicide as a key issue in Rocky Mountain states.
[27] One of the primary examples of anonymous care Stevenson uses are suicide hotlines. See more in Ch. 3.

Data & Analysis

To aid in analysis of the Montana suicide factors, I created an SPSS database of county-level data, containing suicide rates and metrics related to each factor, like elevation, poverty rate, and population density. This included in the appendix. In addition, I conducted an analysis of bivariate correlations between county-level suicide rate and variables representing the eight suicide factors discussed above.[28] Though an oversimplification of the complex factors and inconsiderate of mediating effects, this analysis provides an informative starting point from which more detailed understanding of suicide in Montana can be built.[29] Interestingly, suicide rate's strongest correlation is with sunlight. However, sunlight is highly correlated with elevation, so there is likely a mediating effect between the two. Other factors that have strong correlations with suicide rate are divorce rate, mental health providers, and poverty. Native Population Rate is very strongly correlated with poverty and negatively correlated with firearm suicide and altitude. Finally, it is unsurprising that population density is strongly correlated with mental health providers.

Toward a Syndemic Landscape of Suicide in Montana

It is difficult to simultaneously consider independent suicide factors and the way that they interact with one another to result in suicide. So, as a concluding section, I attempt to synthesize the isolated suicide factors into one, interconnected portrait of reciprocal relationships that

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[28] Data on factors: Divorce Rate (American Community Survey 2015-2019); Suicide Rate (CDC 1999-2016); Native Population Rate (US Census Bureau 2020); Veteran Population Rate (US Census Bureau); Altitude of City Seat (US Geological Survey); Sunlight ; Mental Health Provider Ratio (NPI Registry 2021); Poverty Rate (US Census Bureau); Suicides by Firearm (CDC 1999-2016); Population Density (US Census Bureau 2020).

[29] In choosing data to represent suicide rate and variables, I tried to balance quantity of information with quality. For example, I chose 1999 to 2016 as the time range because it covers much of the recent increase in suicide rate and, being data from the CDC database, allows more detailed information, like firearms by suicide. The MDPHHS has suicide data up to 2019, which is important and more up to date, but lacks the detailed information that is needed for a more complete analysis. Many population measures were chosen based on the recent census data, even though the suicide time range is longer due to many data measures not being collected before the 2010s, like mental health providers. I hope to gather more complete and accurate data as this project progresses.

produce the high rate of suicide in Montana.[30] To do this, I focus on a case study, the American Smelting and Refining Company (ASARCO) Smelter in East Helena, as a case study for testing the syndemic landscape.

East Helena is a small town of about 2,000 outside of the state capitol, Helena. Founded in 1899 after the purchase of a lead smelter by ASARCO, the town and its identity were closely tied to the company until the plant's closure in 2001 (Byron 2007a).[31] Although some were happy to be rid of the plant and its toxicity—it was declared a superfund site in 1984—many longtime former smelter workers described the close-knit community at both the smelter and gathering places after work (Byron 2007b); with it gone, they were concerned that the "culture and makeup of the community" would change, that it was like "East Helena isn't here anymore", and they described the sadness and loss of seeing the stacks demolished (Helena Civic TV 2017). There was clear sentiment and cultural affiliation with the smelter, and the roughly 2,000 that gathered to watch the final stacks demolished in 2009 are a testament to this. How is this sentiment relevant to health, and how can it be made syndemic? Figure 3 illustrates how the complex and converging effects of the smelter closure have affected residents of East Helena, and how the cultural significance of landscape might interact with these effects.[32] If we think of altitude and sunlight as part of landscape instead of isolated biomedical factors, our view of health is enriched.

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[30] Native population is not considered due to the demographics of East Helena, but could be included easily into many other examples around the state.
[31] 55 percent of the town's tax base came from the company (Byron 2007a).
[32] East Helena had a suicide rate of 114 for 2012-2020, or 4 times the state average. This number is likely inflated by the small population of 1,944, but it illustrates the current troubles of the community.

Pervasive stigma exacerbates problems across community

Loss of jobs =
increased
poverty

High firearm
ownership =
increased
suicide lethality

Closure of
ASARCO Plant

Decreased tax
base = less
healthcare
funding

Less community
gathering = increased
isolation and lower
belonging

Increase in
suicide rate

Dismantling of plant
= loss of culturally
significant
landscape

Superfund site = toxic
environment and
decreased time outdoors

High Veteran
population =
increased risk

Figure 3: Hypothetical Model of Syndemic Landscape for East Helena

Following the processual landscape model, how is health affected when traditional ways of interacting with the landscape are interrupted? Thinking altitudinally, this question is most relevant in mining and timber areas of Western Montana, but it can certainly be applied elsewhere. For example, in Butte, the landscape was irrevocably changed after a century of mining, and so were its people when the mining stopped. While this is less dramatic in East Helena, the giant slag pile along the main road into town is a pervasive reminder of change.[33] When the land carries the scars of generational labor, does the continual visual reminder have a negative effect? When a community that is founded on an industry loses that industry, is the community now without foundation?

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[33] Slag is gradually being removed to South Korea to be further refined into zinc and recycled concrete, tying East Helena to global economics in interesting ways that cannot be considered here (Drake 2021).

Skewes et. al (2019, 74) recommend culturally adaptive care "when an adapted intervention would demonstrate respect for a population's cultural knowledge, strengths, values, and worldview." Though intended for non-white populations, this form of care certainly seems applicable in rural Montana, where farmers, smelter workers, and ranchers have unique, historically grounded connections to the land and to their communities. A recent article about the struggle of family farms in Nebraska depicts this generational connection; a teenager, whose family has farmed the land for 150 years, laments, "I don't want to be the weak link and lose it" (Shukar 2021). A Vox video essay on ranching in South Dakota demonstrates that these occupations are more than just business, but culturally significant; one rancher is brought to tears over potentially losing his family's ranch, saying "it's losing a legacy of the family ranch" (Vox Media 2021, 11:47). And, when the smelter stacks fell, how can the according emotional gathering of East Helenans not be described as an "affective ecology" (Haggerty et. al 2018)? Or, does it not follow that residents are "losing a recognizable landscape central to their cultural identity," like the Sakha in Siberia (Crate 2021, 1)?

Even though central industries like mining, logging, ranching, and farming only form a relatively small portion of total workers in communities, it is apparent that they act as a central pillar of identity. When lost, it seems plausible that resulting loss of generational identity and meaningful work would interact with financial instability to have a negative mental effect, especially when stigma is pervasive.

Finally, how can a syndemic landscape be treated? It will certainly require a multi-level, multi-faceted intervention like Mendenhall (2019) proposes for combatting diabetes. A few recent developments in East Helena offer a potential salutogenic approach. Preserve Montana, a Helena non-profit, restored two remarkable Star of David windows from the ASARCO plant,

which will be installed in an East Helena community center to commemorate the smelter's importance to the town; Preserve Montana also aided in restoration of the historic East Helena train depot, which was located near the ASARCO plant. These efforts were covered by local news and drew interest and engagement from the community, which suggests relevance (Ambarian 2021). Could fragments of connection to East Helena's historical identity act in some protective capacity as they draw community members together in remembrance? While the correct path forward is unclear, it is exceedingly evident that Montana public health has a wealth of history and identity to draw upon when addressing the suicide crisis that haunts rural Montana.

CHAPTER 3: MONTANA SUICIDE PREVENTION

"Is there a kind of grim fatality that hovers over Montana? Is the myth of the cowboy West, complete with male independence and derring-do, a repeated invitation to a personal beheading?"

--Ken Egan

"How could it be that a man did everything he knew to do and it wasn't good enough, wasn't even close? What happens when good intentions fail, and the work that makes the man becomes worthless—not just wrong, but simply meaningless, without effect?"

--Judy Blunt

Chapter 2 presented the breadth of issues contributing to suicide in Montana and the uncertainty about which factors are most influential in the state's high rate, underscoring the difficulty of determining which prevention measures to employ with the scarce resources available to Montana mental health providers. This chapter seeks to lessen some of that difficulty by serving as a review of current prevention efforts around the state, questioning the prevailing suicide prevention paradigm, and proposing a prevention model based on the syndemic landscape that holistically addresses upstream drivers of suicide.

Contemporary Prevention

Mental healthcare in rural Montana is notoriously lacking, exemplified in the facts that there is only one psychiatrist between Billings, and Bismarck, North Dakota, a vast distance of 400 miles, and that there is about one psychologist for every 4,000 Montanans (Reel 2019; Silvers 2021). Rural communities, especially those in more isolated areas, face great difficulty in hiring and retaining therapists. This difficulty has been made worse recently; the Comprehensive School and Community Treatment program, which puts mental health professionals in schools,

has had legislative funding dropped and faces bureaucratic challenges, causing many rural

schools to drop the program (Van Alstyne 2021). The Montana State Hospital at Warm Springs

has come increasingly under fire in the last three years as it failed federal inspections, lost federal

funding, and faces allegations of abuse and neglect; amid numerous reports of mismanagement

and mass staff exodus, the MSH administrator was removed from his position in April 2022

(Schubert 2022a, b; Larson 2022a, b,c). This alarming news, coupled with "devastating"

healthcare budgets cuts in 2017 that the healthcare sector is still recovering from—especially in

hard-to-fill rural positions—only heightens the need for quality, effective suicide prevention

(MBPC 2018; O'Brien 2019). One rural organization, Court Appointed Special Advocates of

Park and Sweet Grass counties, is concerned about these recent trends, stating that "Over the

years we have watched the state move toward 'regional hubs' for services during budget

shortfalls. It is safe to say that rural Montana is being further isolated with these cuts, as social

services fail to extend to communities that need it most" (Eggert 2018). There are some

promising developments, however. In the light of these difficulties, lawmakers passed two bills

easing restrictions on licensure and insurance billing to encourage more psychologists and easier

financial access (Silvers 2021). During the COVID-19 pandemic, telehealth emerged as a more

accessible therapy option, and has been especially valuable in the rural communities that are

hours away from in-person therapy offices. In addition, the University of Montana Safe Schools

Center has begun providing telehealth counseling sessions to rural schools in the state by linking

graduate counseling students with places like the one-room schoolhouse in Polaris, where the

program was tested in 2020. Though there was inconsistency as UofM students graduated, the

program had very positive results overall, and filled a role that the single teacher, who teaches K-

8, would have had to fulfill herself otherwise (Borge 2021). They hope to expand the program in the next grant cycle.

Jess Fuhrman, crisis coordinator at Eastern Montana Community Mental Health Center, has been working to combat suicide through a number of crisis-focused approaches suited to the isolated, resource-poor region he serves. One is the EmPATH unit, which stands for Emergency Psychiatric Assessment Treatment and Healing; EmPATH units are intended as a specific space for a person in mental crisis to relax and de-escalate. This is useful as it not only provides care specifically for mental crisis, but it also reduces the resource burden on hospital ERs—which are already strained in rural areas—and takes people out of jails, which can pose a harmful environment (Fuhrman 2022). Preliminary studies of EmPATH units in urban areas around the country have proven effective in reducing time in hospitals and increasing follow-up care (Kim et. al 2022). Fuhrman is also excited about the new 988 hotline, a crisis line that is aimed at being more accessible, like 911, and which just received 105 million in federal funding (SAMHSA 2022). The other primary focus of Fuhrman's is training 500 people in QPR, or Question, Persuade, Refer—a program that trains "everyday people to go out spot the warning signs," and "encourage[s] them to have to have the courage and bravery to ask someone about their suicidal ideations and then convincing them to get help" (Fuhrman 2022). Along with addressing stigma, Fuhrman hopes to dispel Montana narratives about cowboy or homesteader resiliency and self-reliance, calling this attitude "just a band-aid." These narratives are grounded in the region's central industry—agriculture—which is receiving increased attention as an area of mental health vulnerability. AgriSafe Network, a national organization that aims to improve the health of farmers and ranchers, has developed an Agricultural Community QPR program, which is aimed specifically at addressing the unique needs of agricultural producers. The program,

which I completed, has three tenets which differentiate it from standard QPR: *understanding* agrarian culture, *applying* concepts of agrarian culture when providing healthcare, and *identifying* barriers in rural agricultural communities. In practice, this looks like awareness of rural gender dynamics and expectations, the positive and negative effects of close-knit communities like social support and gossip, and tailoring QPR questions to the stigma inherent in many farming areas. On a larger scale, the Montana Department of Agriculture recently received a $500,000 USDA grant to address agricultural stress through free counseling services "provided by in-state providers who have ties to Montana communities and an appreciation for agriculture" (MDA 2021). As part of this effort, the MDA has launched an outreach campaign, Beyond the Weather, to "break the stigma surrounding mental health and encourage Montana ag communities to seek assistance with stress management by moving beyond just talking about the weather"; the campaign promotes resources like MSU's Montana Ag Producer Stress Resource Clearinghouse, the Western Regional Agricultural Stress Assistance Program, and Montana crisis hotlines. This recent attention to ag producer mental health is timely; Fuhrman noted an alarming trend in some Eastern Montana producers, who are displaying hopelessness in completing routine practices, like crop planning. Another issue in the small, geographically distant communities of Eastern Montana is collaboration between groups; Fuhrman is frustrated with the lack of communication and believes that more people should come together to share ideas and pool resources. This issue speaks to the difficulty of community organizing— conceptualized as the 'social cost of space'—which describes the "confounding effect of distance and low population density on the cost of services…there's more time and distance involved in providing services, and fewer people to bear the cost" (Haggerty 2018). In non-government efforts, the social cost presents itself in volunteer burnout and overreliance on a few individuals

to make decisions (Gansauer & Haggerty 2021). In Sidney, however, the Communities in Action group, which organized in response to the 2010s Bakken oil boom, has been lauded by both Haggerty (2018) and Fuhrman as an example of excellent community organizing and collaboration, and could serve as a guidepost for other rural areas. Despite the geographic and financial challenges to Eastern Montana, Fuhrman is hopeful, stating that "we're at the beginning of a cultural revolution when it comes to mental health and suicide education. A lot more people are going to be learned about mental health issues."

Karl Rosston, suicide prevention coordinator for MDPHHS, shares a practical, crisis-oriented approach. He points to stigma as the most significant contributor to Montana's high suicide rate, touching on similar cultural narratives to Fuhrman: "We have that cowboy mentality and that sense of independence. We take care of our own. We don't like to talk about our problems. And especially when it comes to issues like depression and anxiety, we see it as weak. And then we see ourselves as a burden. And if you think you're a burden, how likely are you to ask for help?" To combat this, Rosston advocates for a "cultural shift in thinking." How to accomplish this? Though he acknowledges that it might take generations to effectively change thinking, Rosston has a number of ideas, and maintains that his programs, which he has been promoting for fifteen years, will be effective.

Stigma is not the only focus of Rosston, as he describes the "perfect storm" of intermingling factors that produce Montana's high rate. One of Rosston's primary focuses is youth outreach, asserting that "early intervention is critical"; he is worried that the ability to deal with adversity is diminishing, and that resilience programs are key. He cites the PAX good behavior game as a program that has had good success in building resilience and discouraging harmful behaviors. Brittney Petersen, director of Richland County Health Department,

especially focuses on early intervention to "get ahead of mental health problems" down the road, emphasizing emotional intelligence like PAX. In addition to these programs, Rosston hopes for more early identification of mental illness—90% of those who die by suicide have a mental illness—through universal screening, similar to a physical check-up. Rosston also points to the state's high-risk populations, like middle-age white men, as an important point of intervention. Hard to reach given a general lack of usage of medical services, middle-age white men make up the majority of workers in industries with high rates of suicide like construction and agriculture. Rosston cites the incorporation of suicide prevention messaging into Department of Labor workplace safety trainings as the best way to reach this population. Musing on construction and other labor-intensive industries like logging and agriculture, Rosston adds, "I think the pride that many people have, have taken traditionally in a hard day's work…is kind of being lost because the way all businesses are of kind of cutting out the middleman, be it going to a more mechanical or, you know, machinery type of stuff. I think all of that starts to gradually weed people out as far as their relevance." He also acknowledges the economic challenges inherent to these industries as magnifying mental illness.

Regarding other key suicide factors, healthcare and firearm access, Rosston is realistic, plainly stating that "We're never going to have enough mental behavioral health providers in our state," and resigning to the fact that firearms are too ingrained into Montana's culture to attempt to restrict.[34] He adds, "We should have at least four or five state psych psychiatric hospitals, but because of our low dense population density and the cost, we barely have one, you know, and then they're under constant scrutiny and having cuts to their budgets. So, we aren't prepared to

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[34] Montana has the highest rate of firearm ownership in the US. See Chapter 2 for a discussion on limiting firearm access as a method of suicide prevention.

live adequately and in a healthy way in a state, the size of Montana." Like Fuhrman, though,

Rosston urges patience and is confident that progress *is* happening, albeit slowly.[35]

A New Paradigm?

Illustrated vividly in the nearly ubiquitous black

and red SUICIDE PREVENTION poster (see fig. 1),

the obligatory placement of crisis lines in any

publication mentioning suicide, and in Rosston and

Fuhrman's public health efforts, the majority of

Montana suicide prevention is crisis-centered. While

crisis hotlines have proven effective at improving short-

term outcomes in a review of studies, Hoffberg et. al

(2020) call for more follow-up services and research on

long-term benefits, which are mostly unknown. So,
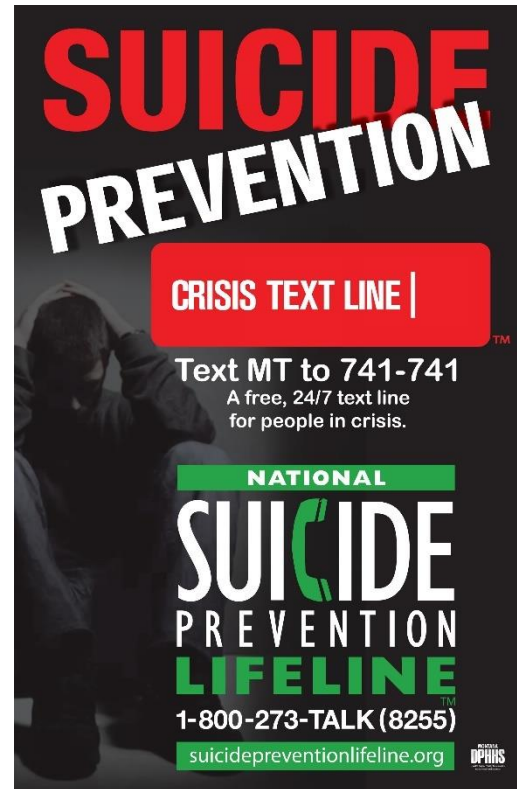
while there are definite benefits to hotlines and similar crisis methods like EmPATH units and

QPR trainings, what about upstream causes? And how can the Refer portion of QPR be effective

when there is no provider to refer to? Though a call to a crisis line will likely back an individual

off the precipice of suicidal ideation, it does not solve the myriad problems that contribute to that

individual reaching the breaking point. This mirrors Ramirez-Ferrero's (2005, 3) experience as a

rural public health worker: "they designed and implemented trainings to teach coping strategies

and communication skills. But hardly anyone was talking about the root cause of stress," adding

that programs were "firmly centered on individuals and what they lacked—resiliency, skills,

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[35] Brittney Petersen, director of the Richland County Health Department, detailed a recent study mental health services in a few eastern Montana counties, and it found a "severe lack of providers," with many suffering from a mental health crisis forced to go to an ER or jail due to a 4-6 week wait to receive services.

information—and not on the economic crisis in family farming and the changing nature of rural communities." Depression, the most prominent mental illness and which contributes to suicidal ideation, is on the rise—why? As a biopsychosocial illness, depression must be attended to at biological, psychological, and social levels (Walker 2008). The universal screening Rosston promotes is an important tool for identifying illness and providing treatment early on (if available or accessible), but it does not contribute to relieving systemic pressures on people or communities. Agriculture stress programs are similar. Is there a danger in not addressing each step of the Three-Step Process? Although the colonial relationship is absent, Lisa Stevenson's (2014) ethnography of Canadian care of the Inuit suicide epidemic must be studied as a warning of the dangers of a primarily crisis-focused suicide prevention.[36]

In doing so, we must first define care in the context of suicide prevention. What is care? Often imbued with positive intentions, care is a complex idea, and its effects and goals are perceived wildly differently depending on the perspective of care provider or care receiver. It is an idea wholly tied to the subject of suicide, and it deserves meaningful thought. Stevenson (2014, 3) considers it "as the way someone comes to matter and the corresponding ethics of attending to the other who matters," preferring to move away from "frequent associations with either good intentions, positive outcomes, or sentimental responses" in order to "nuance the discourse…so that both the ambivalence of our desires and the messiness of our attempts to care can come into view." The defocusing on care's positive implications is an essential aspect of Stevenson's (2014, 4; 44) argument, as she details the austere, bureaucratic, and often harmful care that the Canadian government provided for Inuit communities affected by tuberculosis in the 20th century and that the Nunavut government provides in response to suicide currently. Their

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[36] See the firearm section of Chapter 2 for more discussion on this idea.

care fails to consider the desires and needs of individuals being cared for (*who* is being cared for), instead imposing a blanket and anonymous "regime of life" wherein "death is not a thinkable option" (Stevenson 2104, 8; 104-105). It is "primarily concerned with the maintenance of life itself, and is directed at populations rather than individuals"; she deems this method of governing "biopolitics" (Stevenson 2014, 3-4).

In her study of interactions between caretakers and orangutans at wildlife refuges in Borneo, Parreñas (2018, Location No. 1208; 1280) defines care as "labor that is performed with or without monetary compensation and embodied through the signs of gender and race," and adds "mutual vulnerability"—unevenly shared—as an important component. Speaking on caretakers' attempts to prevent orangutan extinction—which involved forced feeding and copulation—Parreñas (2018, Location No. 3508) asks: "can we be less enamored with the proliferation of new life and be more concerned with the process of dying well?"

Both writers are thus noticeably frustrated with a sort of blind imperative to life where indifference to identity is implicit—an imperative that seems characteristic of mainstream ideas of care.[37] They look for alternatives to regimes of life through different methods, but conclude with similar assertions:

> We must be open to the possibility of uncertainty and maybe even failure (Parreñas 2018, Conclusion n12).

> Living, as opposed to staying alive, seems to require both pain and the taking of risks. It seems to require risking the possibility that one will not stay alive (Stevenson 2014, 97).

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[37] Stevenson asks whether such indifference is built into population level care interventions. If it is, this factor does not preclude the possibility of an alternative, and only demonstrates that one is necessary to a greater degree.

The indifference to individual identity is closely tied to empirical medical science; when aspects of life cannot be logically measured or put into statistics (e.g. climate, income level, gun ownership), they are often ignored as unreliable or *uncertain*—to the detriment of an understanding of the individual's reason for not wanting to live. By abandoning the mandate to preserve life and medical/scientific certainty, new theories and ways of thinking about care are opened to study.

And, though broad in scope, these definitions of care provide a few key concepts to keep in mind: sociocultural value, community, identity, and vulnerability. Of course, these concepts cover a great range of the human experience, and speak to the prevalent role care plays in society. When a more general and applicable definition of care is adopted that allows for its prevalent role, further and more diverse use of care theory is revealed.[38]

Syndemic Intervention

With these theoretical and moral concerns in mind, what is the alternative? Although we have to work within the geographical and financial limitations of rural Montana, thinking about suicide prevention through the syndemic landscape offers a potentially more comprehensive and beneficial policy approach. This approach is centered in the idea of a syndemic intervention, described by Mendenhall (2017, 890) in the Lancet: "syndemic knowledge makes it possible to intervene effectively at both the policy and clinical levels. By addressing both the roots of sickness (inequality) and the treatment of symptoms (clinical care), syndemic intervention can

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[38] In framing this comparison, I do not insinuate that suicide prevention and mental health workers in Montana do their jobs with malice, ill intention, or apathy—in fact, most people I interviewed for this project, both in mental health and generally, had personally experienced a suicide death in their lives and are passionate and caring in their desire to reduce suicide. But, given the disturbing failures of care at the Montana State Hospital and the sustained rise in suicide rate, we must be prudent and ensure that empathy and a reduction in suffering are prioritized in Montana's approach to suicide prevention, especially at a governmental level.

strengthen strategies of prevention and care by considering the full scope of syndemic

vulnerabilities, rather than treating disorders individually and ignoring the complex contexts in

which they occur"; or as Singer et. al (2017, 947) frame it, a syndemic intervention encompasses

a "multifactorial, multilevel treatment model" that takes an "integrated approach to

understanding and treating diseases that can be far more successful than simply controlling

epidemic disease or treating individual patients." The Montana DPHHS has already done

excellent work in describing the multiple factors contributing to Montana's suicide rate—that

knowledge just needs to be applied at multiple levels and sites of intervention. Although suicide

prevention is not as straightforward as treating physical diseases like HIV, diabetes, or

tuberculosis—traditional foci of syndemics—Montana must do more to relieve suffering,

however ambiguous the path forward may be; as Calvin Mann, a mental health service provider

in Montana laments, "mental health is the most difficult discipline to come up with measuring

success" (Van Alstyne 2021). Nonetheless, a syndemic intervention to suicide might look like:

addressing root causes of poverty and expanding affordable access to healthy, local food,

looking at changeable aspects of rural isolation, continuing to dispel stigma and myths,

expanding outreach to middle-aged men, providing meaningful policy that reckons with the

historical and present-day suffering of Indigenous populations, deepening understanding of the

impact of environment (altitude & Vitamin D) on health, documenting and supporting the

emotional ties that individuals have to place and heritage, ensuring the health of veteran

populations, and at least *attempting* to implement safer firearm policy. And, overall,

incorporating the salutogenic approach covered in Chapter 2 might prove fruitful: how can we

foster the existing positives of rural Montana, like community collaboration and support,

neighborliness, and close relationship to land?

This is not to put the entire weight of addressing suicide on the few full-time professionals in Montana suicide prevention, but it is pointing out the fault in that singular focus. The prevalence of suicide is the result of cultural, environmental, and societal patterns, and must be collaboratively and communally addressed for real change to happen. Richland County Health Department director Brittney Petersen points out that there is a significant amount of attention to behavioral health currently, and that the "time is now" to get money for programs; perhaps this is also an opportunity to try a new approach to suicide prevention.

In Chapter 4, I detail a potential rural Montana agricultural syndemic that offers insight into the current unhealth of rural Montana. In Chapter 5, I discuss the work of scholars and community members across that state that are rethinking agriculture and relationship to land—with beneficial results for rural Montana and the mental health of the individuals that populate it.

The McMaster Ranch. June 2021.

    A few miles east of East Helena, a small ridge of brown-grey rock named Spokane Mountain juts out above the tree-bare, scrubby hills that surround Canyon Ferry. At its base is a small collection of ranch buildings, many of which are warped, splintered, and bent from years of unobstructed sun and harsh wind—the McMaster Ranch. I'm on the roof of one of these—an old one-room schoolhouse that's been out of use for decades. We're replacing its century-old shingles that are baked through and half missing.

    This land feels empty of people, of noise—only the meadowlark and occasional train for company. I wonder how useful this project is—who benefits from this preservation? Dolly McMaster, 94, the last of the McMaster line, is funding the repairs. She attended the school as a girl, and hopes it will be turned into a museum someday. Her family's ranch used to sprawl

around Spokane Mountain, but Dolly has sold most of the ranch land to the Bureau of Land Management, which will get her remaining land when she dies—she had no children to pass the land to. The collection of fruit trees in her yard has been designated a Montana Heritage Orchard, and the ranch was recently added to the National Register of Historic Places, and yet—it will likely never be used as a ranch again.

Across the highway, another schoolhouse is being preserved. It is larger, made of stone, fitting a European countryside better than Montanan. For years, a herd of cattle played schoolchildren inside, wreaking havoc on the structure. It will be left in a conservation easement once the landowners die. Dolly attended this school as well. Is something lost when these generational agricultural lands go out of use? Why is this happening?

CHAPTER 4: THE RURAL AGRICULTURE SYNDEMIC

"We've tried to grow our way out of this problem by getting bigger and more efficient. But it just seems to get worse. And it's frustrating, it's depressing. It just seems like there's nothing we can do about it, and nobody's listening. Nobody cares."

-Walter Schweitzer, MFU President

*"Surely the legacy of failure, the memory of devastated crops and withering dreams, haunts the region's culture"*

--Ken Egan

"Overnight, it seemed, the place I grew up on had fallen under the wheels of big business—big land, big lease, big machines. Big debt."

--Judy Blunt

Industrial agriculture has had transformational impacts on the agricultural sector and communities tied to it, contributing not only to increases in nutrition related health conditions like obesity and diabetes, but also to rural outmigration and poverty, environmental degradation, pesticide-related cancer, and, I argue, the mental health crisis in rural communities. This entanglement of diseases, widespread social impact, and environmental harm has created a rural agriculture syndemic that potentially provides key insight into the suicide crisis in Montana.

Industrial agriculture is characterized by highly mechanized, large-scale farms—usually farming monocultures—that use large amounts of fertilizer and pesticides in order to produce consistently high yields; it is inextricably tied to vertically integrated corporate monopolies that control production, processing, and marketing of goods (Goldschmidt 1978; Berry 1977; Quinn & Carlisle 2019). At first glance, industrial agriculture has done wonders for the industry, almost tripling output between 1948 and 2019; this increase is a result of inputs shifting from predominately labor and land to high-tech machinery and chemicals (Wang et. al 2022). Unfortunately, the dramatic increase in productivity has come at a great environmental and social cost, with little benefit for producers—a transformation ultimately deemed a "radical restructuring of rural America" (Hightower 1972). These costs stem primarily from two developments: the drastic decrease in the amount of farm labor and from corporate agribusiness' systemic manipulation of economics and politics.


Rural Agriculture Syndemic Landscape

Labor

Population Change: 1960 to 2007
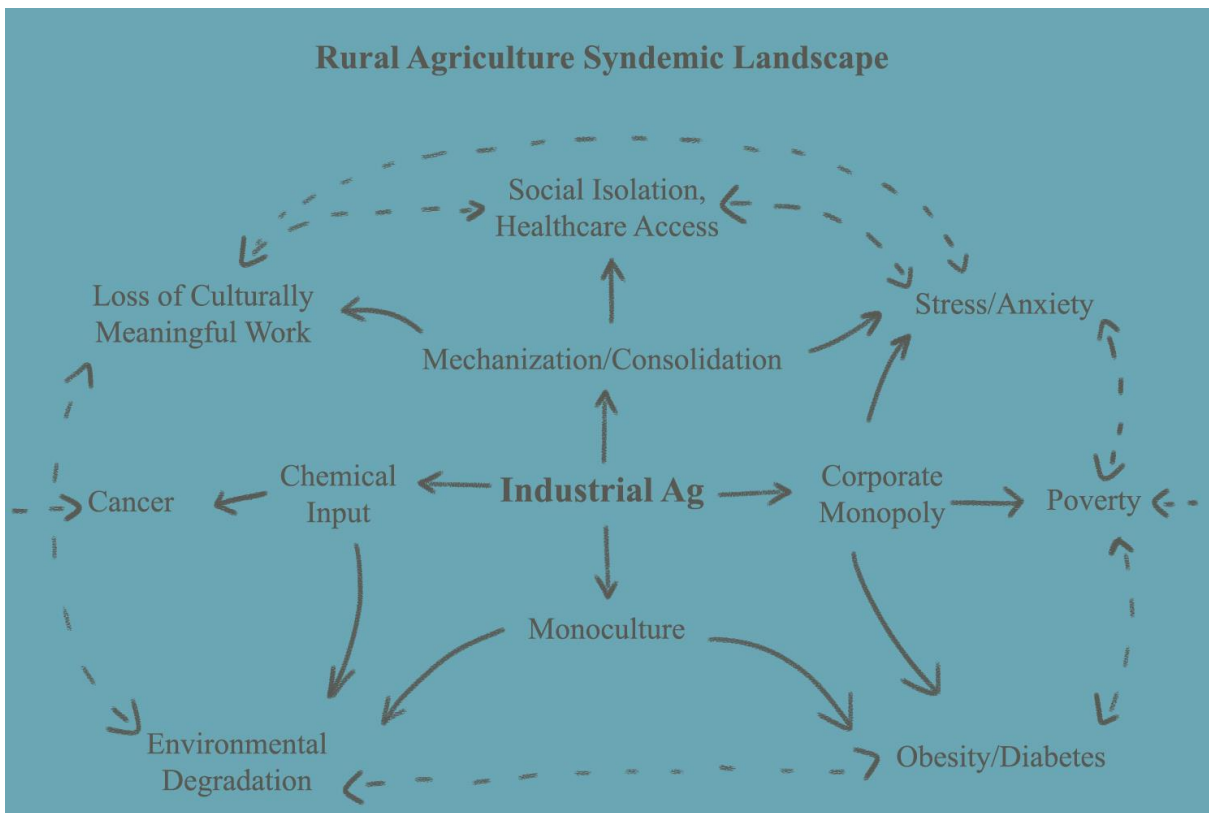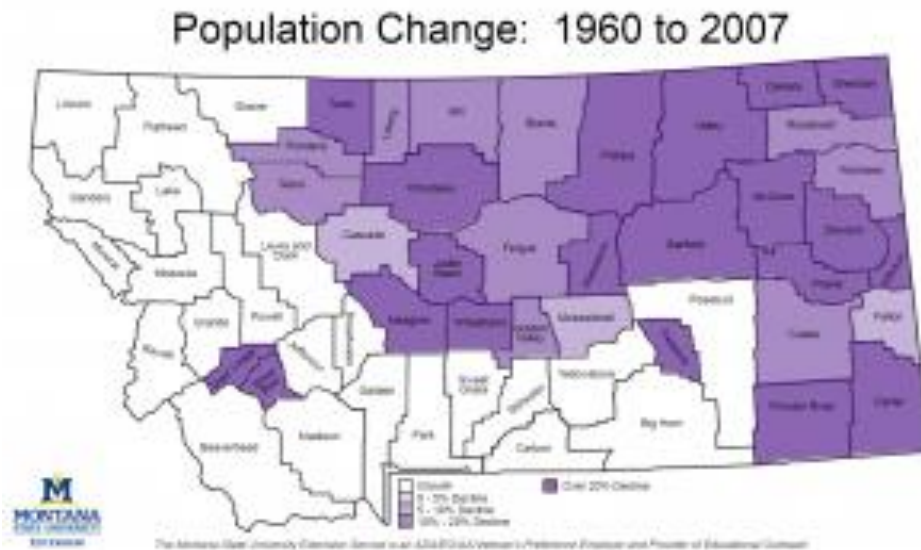
The proportion of US population working in agriculture has decreased significantly in the last century, from 27% in 1920 to around 1% in 2017 (Bellis 2021, USDA 2017). Along with increasing urbanization and industrialization, this trend resulted from intentional government policy; 1970s secretary of agriculture Earl Butz' "get big or get out" and "adapt or die, resist and perish" mantras were key in a shift from New Deal farmer "supply management" policies that balanced prices to an emphasis on efficiency and productivity above all else; by nature, this policy favored large operations that could take advantage of economies of scale (Philpott 2008; Berry 1977). This resulted in massive surpluses and a rush to take out more loans to buy more equipment and infrastructure to increase production, and eventually culminated in the farm crisis of the 80s when prices crashed and many farmers defaulted on loans, declared bankruptcy, and had to sell the farm (Ramirez-Ferrero 2005; Philpott 2008). In the long-term, this agribusiness-friendly policy hastened the decline of the producer population as failing small-scale operations were gobbled up by large-scale operations and as the push for increased mechanization

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eliminated the need for extensive human labor (Hightower 1972). Out of a job, millions of rural Americans left their communities for opportunities elsewhere, resulting in massive unemployment—and discord in urban areas. Though the simultaneous increase in output and decrease in producers might suggest prosperity for remaining producers, net farm income has remained largely stagnant in the same time frame, demonstrating the lack of tangible benefit for producers (USDA 2017; see figure).
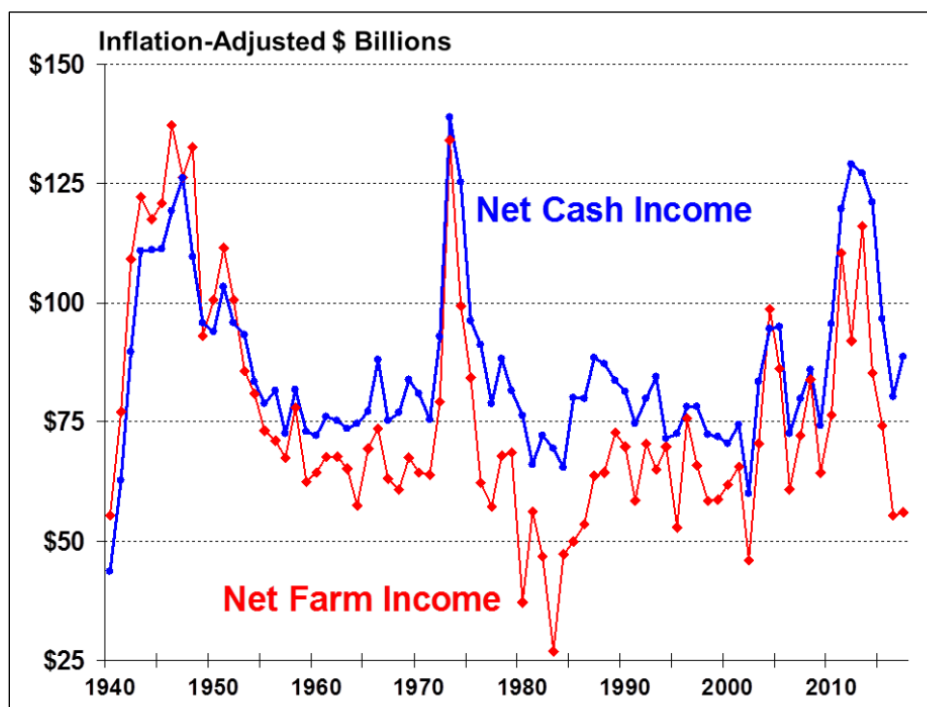
Source: ERS, "2017 Farm Income Forecast," August 30, 2017. All values are adjusted for inflation using the chain-type gross domestic product (GDP) deflator, where 2009 = 100, Office of Management and Budget (OMB), Historical Tables, Table 10.1, https://www.whitehouse.gov/omb/budget/Historicals; 2017 is forecast.

In fact, the outmigration had cascading negative impacts on those remaining: "with the exodus of farmers came the failure of many small businesses, which no longer had the support they needed to keep their doors open. Communities that had once been vibrant places to live came to resemble outdoor factories, with large tracts of land managed by a handful of overworked farmers who no longer had many places—or much time—to gather and socialize"

(Quinn & Carlisle 2019, 39-40). Quinn (Ibid, 41) sums the process up in Big Sandy, a central Montana wheat town, as a "loss of infrastructure, institutions, and relationships: the fundamental things that held our community together. The country dances had disappeared, as had the community picnics along the river. There were fewer businesses on Main Street." Montana Farmer's Union president, Walter Schweitzer of Geyser (2022), shared a similar experience: "we had resiliency when I first started farming, we had a meatpacking plant in every major town in Montana, we had flour mills, we had bakeries, we had home delivery milk. We have none of that now." In an illustration of the extent of change, Schweitzer (2022) described Geyser's need to consolidate with five schools across three counties just to field a six-man football team. This speaks to a larger issue of age; most who migrate out of rural communities are young and can't afford to stay on the farm; the average age of farm producers has risen regularly; in Montana, more than half of producers are past or close to retirement age (USDA 2017; Lister 2020). These changes illustrate the psychological harm of labor loss; community gatherings effectively served as support networks, allowing people to "share troubles," and bond; when they disappear due to outmigration, isolation increases (Schweitzer 2022; Ramirez-Ferrero 2005). This is essential, because the tax-base for public institutions like schools and healthcare is also crippled by outmigration, reducing healthcare resources for an already struggling population. Ultimately, the farm and the rural town are intricately connected: "as life in the fields and along the sidewalks goes, so goes the life of the town, and along with it, the life of the hospital, the high school, and the local Christmas pageant" (Reding 2009, 5).

Agribusiness

From the land grant university research complex to the farm bureaucracy to the economic system, the entirety of agriculture has gradually been structured to serve corporate interest—

despite the image of the downtrodden farmer that much agricultural policy purports to cater to (Goldschmidt 1978). In what many describe as a betrayal of the public interest, land grant university research is primarily used to develop machinery, seeds, and chemicals with corporate and *taxpayer* support, sometimes resulting in exclusive usage rights for corporations; as Hightower (1972) details, corporations are intimately tied to these colleges, often serving on college advisory boards and helping research to be published. As a result, new research is designed for corporate needs; machinery is solely large-scale, and crops are designed for use in input-intensive systems; in other words, the small independent farmer gets no benefits from public research (Berry 1977). Goldschmidt (1978, xxiii-xxiv), in his ethnography on some of the first industrial agriculture developments in California's Central Valley in the 1940s, is scathing in his assessment of the warping impact of agribusiness: "big business operators utilize the media to suppress free inquiry, influence legislation to further their self-interests, and punish those who hold other views." The routinely large number of agribusiness executives in government administrations is a testament to this impact (Philpott 2007). Goldscmhidt (Ibid. xxvii) points especially to the concentration of production and marketing power without regulation, which "permits the corporation to pass the costs of its mistakes and excessive profit margins either forward to the consumer or backward to the supplier."

With massive power over the system, vertically integrated corporations can slash labor costs by relying on cheap migrant labor and buying out local food processers, then slashing wages; one Iowa Tyson plant reduced wages by a third and cut benefits, then advertised directly to Mexican laborers for labor: "the link between the agricultural business, meatpacking, and illegal immigration would appear to be self-evident" (Reding 2009, 159). With low wages and fear of deportation, immigrant workers are easily exploited; Carlisle (2022, 126) asserts that "US

agriculture has never evolved beyond its dependence on an oppressed workforce," merely shifting from poor black laborers to immigrants. A key component of this system is local dollars; as corporations buy out local business or force them to close, they are "extracting value out of the entire supply chain"; instead of money staying in the local community and changing hands multiple times, it instead changes hands only once (Quinn & Carlisle 2019, 4; Reding 2007). In the nonsensical service of an optimized, efficient supply chain, Schweitzer notes that in Montana, "all our livestock and our grains are shipped 1000 miles away to be processed and packaged and then shipped 1000 miles back to a corporate chain…and it's heavily processed food. It's not even healthy food." The effect of agribusiness on Montana food systems has been dramatic; while 70% of food Montanans ate was produced in the state in the 1950s, today only 10% is (Wolfe 2020). This development is ironic for food like wheat and beef, which Montana produces large quantities of.

Cattle producers are hurting especially under this system as the four major meat companies—Tyson, Cargill, JBS, and National Meat—process 80% of US cattle; in a recent widening of the power gap between rancher and corporation, the meat giants are receiving record prices while paying less for the beef they buy, and cattle producers today receive 30% less of every consumer dollar spent on beef than 50 years ago (Hettinger 2020; de Leon 2022). As a result of this corporate market domination, ranching isn't financially tenable. 58% of U.S. producers support their operations with another job in town—especially to obtain health insurance, which simply isn't affordable on a rancher's thin profit margins (Schweitzer 2022; de Leon 2022; USDA 2020) This lack of profitability and the proliferation of machinery use is a significant contributor to rural outmigration. As Schweitzer (2022) relates, "if we could make a living, my grandkids would come home—my kids would come here…we wouldn't be selling our

places." In essence, agricultural communities in Montana have become similar to the infamous

mining towns of years past: "historically, farming communities were models of rural economic

health, and mining communities like those in the Appalachians were an indicator of a crippling

system of centralization. Today, farming and mining communities are indistinguishable" (Reding

2009, 188).

Chemicals

An essential component of the agribusiness sector is chemical input—both fertilizers and

pesticides. Although chemical inputs have done wonders for crop yields, they cut into much

potential profit for producers; as Quinn (2019, 7, 55) details of his own experience growing

wheat, practically all of his government subsidy money went directly to paying for inputs,

labeling the process a "chemical treadmill" that undermined "long-term profitability." Not only

do profits only go to chemical companies, but there are serious environmental and health costs of

heavy chemical use.[39]

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[39] Foundational among these is soil health. Termed soil mining, the practice of inputting heavy amounts of chemicals into crops effectively mines the soil of nutrients as plants require more fertilizer to grow in depleted soil, which is rapidly drained of nitrogen in grain monocultures (Carlisle 2015). Unlike traditional fertilizer such as manure or nitrogen-fixing legumes, human-made fertilizer—though chemically identical to the nitrogen in nature—doesn't nurture the microbiology of the soil, which is essential to plant health (Quinn & Carlisle 2019; Carlisle 2022). Over the years and without fallowing, the fields eventually become mined of all their nutrients and unable to grow healthy crops. Environmental effects extend beyond the field as well—fertilizer runoff damages animal and plant life in connected waterways because plants can't absorb all the nitrogen applied, eventually resulting in catastrophic developments like the Gulf of Mexico dead zone; it can also leach into groundwater, posing a threat to local inhabitants (NCEI 2021). Finally, the energy costs of fertilizer production contribute to 1 to 2% of global CO_2 emissions (TRS 2020).

       Pesticides are the other key component of chemical input; its use is harmful to the environment and to those applying it. Entailing different applications such as fungicides, herbicides, and insecticides, pesticide use ramped up with the advent of industrial agriculture—most notably with the infamous DDT (Unsworth 2010). Glyphosate, or Roundup, is now the most used pesticide in the world—though its safety for human health has been called into question, being labeled as a 'probable' carcinogen (Davoren & Schiestl 2018; Meyers et. al 2016). In addition to the human risks that many pesticides pose, they can collaterally damage plant and animal life nearby (PSU Extension 2017). And, similar to fertilizer, pesticides can significantly increase producer's input costs. As Bob Quinn attests, the costly pesticides sometimes do not even work if timed badly—he once had his field sprayed only for grasshoppers to devour his fields after the pesticide had worn off (Quinn & Carlisle 2019).

Though industrial agriculture places the highest emphasis on production and efficiency, it is remarkably energy inefficient; due to chemical inputs as well as high machinery use, it takes an average of 7 to 10 units of energy to produce one unit of food energy in the U.S. ().[40]

Monoculture

Industrial agriculture is dominated by the use of monocultures—primarily corn, wheat, and soybeans. Though monocultures have produced high yields for decades, it makes farming costlier, is more vulnerable to failure, and it drains the soil of nutrients.[41] So, why is it still the dominant form of agriculture? Monocropping plays directly into agribusiness systems: "most American farmers [aren't] growing food but rather raw ingredients for big food processors" (Carlisle 215, xiv). For example, about 80% of corn is split between animal feed and ethanol, and much of the rest is exported or turned into high fructose corn syrup—only about 2% is sweet corn, which we eat as canned corn or corn on the cob (USDA 2013). The monocultures that are grown for food often aren't optimized for nutrition, but for quick growth, size, and appearance; modern wheat, for example, causes inflammation in many, and has prompted many to adopted gluten-free diets (Quinn & Carlisle 2019).

 In addition, this system isn't self-sustaining. The price of sugar is artificially inflated so that high fructose corn syrup is the cheap sweetener of choice, and ethanol is completely propped up by government subsidies (Philpott 2011).

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[40] This statistic varies widely depending on product, with small scale crops costing much less energy than beef.
[41] Monocultures, naturally, are not as diversified as growing multiple different crops, so one weather event or pest that the plant is vulnerable to can ruin the entire harvest, rather than just a portion (Quinn & Carlisle 2019). Because of this, monocultures require more pesticides and attention for the crop to maintain high yields, and thus more money. Using any of one plant repeatedly in the same field drains that field of the nutrients the plant needs, so over time, the field gradually produces lower and lower yields, unless rotated or left fallow (Berry 1977; Carlisle 2015).
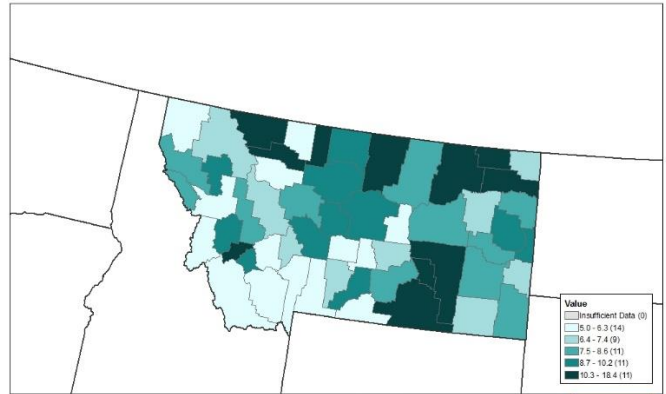
Obesity, Age-Adjusted Percentage, 20+, 2017
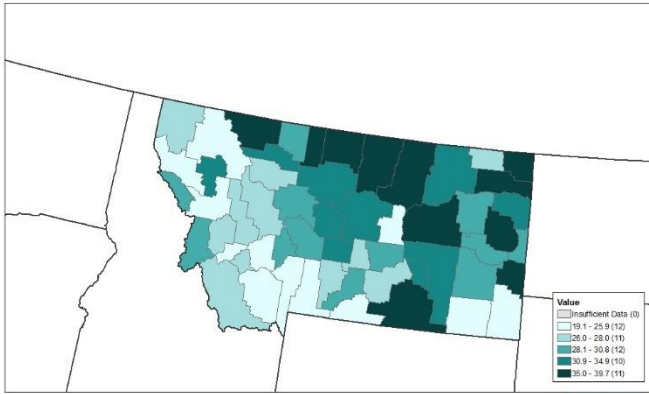
Diagnosed Diabetes, Age-Adjusted Percentage, 20+, 2017

Percent of total population in poverty, 2019: Montana
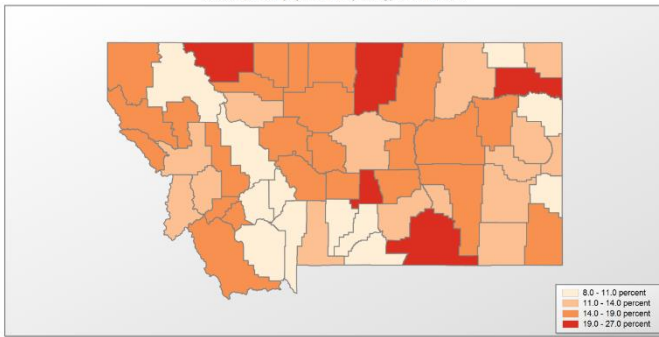
Incidence Rates† for Montana by County
All Cancer Sites, 2014 - 2018
All Races (includes Hispanic), Both Sexes, All Ages
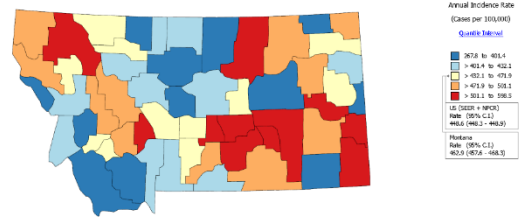
Figures 1-4: these maps demonstrate how the multiple health effects and economic disadvantages of the rural agriculture syndemic cluster in the agricultural eastern, central, and northern portions of the state.

The Syndemic

As industrial agriculture reduces the number of farmers, people leave rural communities, causing the economy and public services to contract. This increases poverty, isolation, and access to healthcare services–all contributors to mental health. The shift to monocultures and corporate supply chains takes local, healthy food out of the community and replaces it with cheap, processed food in corporate chains not in the community—contributing to obesity and diabetes. The heavy use of pesticides contributes to higher cancer rates and damages the environment. And, as industrial agriculture leaves producers with little income to circulate within

the local economy, poverty increases. The sum of these interrelated environmental, nutritional, economic, and mental effects adds up to a significantly damaging system in rural communities and as a state with higher-than-average proportions of land and economy in agriculture, Montana is especially affected by this syndemic.[42]

Obesity/Diabetes

Though often blamed on poor lifestyle habits and diet, rural obesity and diabetes can be directly linked to changes in the U.S. food system.[43] Of the many small businesses described by Quinn and Schweitzer as disappearing from rural towns, local grocery stores were one—with negative impacts for the health of residents. As local stores were put out of business by giant chains like Walmart in nearby large cities—like Great Falls—residents became reliant on global food systems, complete with ultra-processed foods that provide little nutrition; this is reflected in the fact that 75% of the most food insecure counties are rural (Quinn & Carlisle 2019). Swinburn et. al (2019) have detailed the relationship between malnutrition, agriculture, and climate change as a global syndemic; energy intensive food production—most notably cross-country or international food shipping and year-round produce—has severe impacts on carbon emissions. And, inherent to the agribusiness model is adding value to products through additional processing, like turning potatoes into chips and milk into ice cream; this involves not only increased energy inputs but also reduces the nutritional value of the food (Swinburn et. al 2019). When the government directly subsidizes these practices (see monoculture section) over more sustainable, small-scale or local food production, it is easy to see why obesity has become so prevalent across America, and the world. Yates-Doerr (2017) demonstrates a similar effect in

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[42] Around 4.5% of MT population is involved in agriculture, compared to 1% nationally. 62% of MT land is in agriculture, compared to 44% nationally (MDA 2022; World Bank 2020).
[43] The Montana DPHHS (2020) advocates for a diabetes prevention program that focuses on "intensive lifestyle intervention," "behavior change," and "ways to become more active," with no mention of effects of food systems.

Guatemala, as local Indigenous food markets were replaced by multinational supermarkets; these were found to directly contribute to diabetes and obesity in the community. Similarly, Carlisle (2022) details the harmful effects on other agricultural communities via the Green Revolution; the very poor farmers that the revolution proposed to feed were pushed out of business by corporate monocultures—they were fed, but lost their livelihood, and the diverse, nutritious food it produced in the process.

As depicted in both in figs. 1 & 2, obesity and diabetes largely cluster in the agricultural Hi-Line and Eastern portions of the state.[44] Because unhealthy food is cheaper than quality, healthy food, poverty increases obesity and diabetes. Both of these conditions have been linked to increased depression.[45]

Mental Health

Mental health is relevant to the rural agricultural syndemic in four ways: isolation, gendered pride, economic uncertainty, and place identity. In addition to the outmigration described in the labor section on page __, isolation is already higher in the remote and sparsely populated areas of rural Montana. Though not relevant to the entirety of rural areas, male pride in farming is described as being a significant contributor to farming practices; Carlisle (2015, 3) colorfully describes the mindset: "amber waves of grain were like a religion in this part of the West. Any other plant life was labeled a weed and taken as a sign of some deep character flaw, some profound failure. Here in central Montana, the measure of a man was in plain sight, and it was calculated in bushels per acre."

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[44] Although overall obesity rates in Montana are lower than the national average, primarily due to the wealthier and outdoorsy Missoula and Gallatin Counties, most of Eastern and Central Montana has rates higher than the national average.

[45] Poverty, diabetes, and food deserts are especially prevalent on American Indian reservations across the country, and this is reflected in counties with reservations routinely exhibiting higher health problems.

Because of this link between sense of self/masculinity and farm success, it can easily become a source of shame and anxiety when things don't go as planned, as Ramirez-Ferrero (2005) routinely documented in his study of the farm crisis in Oklahoma. Even when failures occurred due to events out of farmers' control such as extreme weather or market crashes, farmers remained ever-cognizant of the way their neighbors perceived their success as a producer—buying more equipment when in debt to maintain appearances and refraining from talking about their problems with friends; unfortunately, this behavior frequently resulted in severe harm for the farmer: divorce, bankruptcy, and sometimes—suicide.[46] The subject of economic failure touches on an issue that affects the entirety of rural communities—stress and anxiety. Jaicks (2022, 35) relates the experience of a Montana rancher: "we all need to have our heads examined because normal agriculture across America right now operates for about a one-and-a-half percent profit margin. It's a really tight deal you are playing with, yet you're handling hundreds of thousands of dollars. I've heard many farmers and ranchers say if you want to be a gambler, don't go to Vegas, buy a ranch or farm. It is a way higher stakes game of craps." Whether it's caused by weather or economics, this incessant uncertainty takes a toll on producers and the surrounding communities that revolve around agriculture. Finally, I argue that there are meaningful emotional connections to the place and work of rural Montana that detrimentally affect individuals when disrupted. Though this potential connection is overlooked by medical science, a wealth of Montana voices illustrates its relevance; it is beautifully summed up by Bob Quinn (2019, 5 emphasis added): "to me, there is something almost sacred about growing wheat. Nearly every spring of my life, I have held in my hands a seed passed down over five hundred generations, a seed that has nourished my fellow humans for some ten millennia. Holding that

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[46] Ramirez-Ferrero reports that the amount of farmer suicides is likely underreported, as many farmers will frame their suicide as a farming accident to save face and to provide their family with insurance money, as some say: "I'm worth more to my family dead than alive."

wheat seed in my hands, I feel connected to the billions of my human brothers and sisters who have turned to this same grain to break bread with one another: to nourish, to celebrate, to earn an honest living. *So much of what is meaningful in human life is there in that grain*." Generational connection is a common thread; when asked why he persists in agriculture despite its great challenges, Schweitzer replied, "It's in my blood. It's who I am."

An essential component here is the producer's specific land. For Western Montana ranchers, land is the "heartbeat of communities and foundation on which people form a sense of who they are and how they orient themselves in the world," so that "lives, communities, and livelihoods are inextricably intertwined with their local landscapes" (Jaicks 2022, 64, 2). Jaicks (2022, 2) goes on: "These ranchers possess a depth of commitment to integrating the implications of the work they do to ensure a place for more than just humans on the landscape. They shoulder a sense of responsibility of bridging the past with the present and bear a steely determination to ensure their children and grandchildren can hold on to a heritage that spans centuries and generations." Because the gravity of these relationships to the land and work are fulfilling and meaningful, they are similarly painful when they become disconnected. As Schweitzer described, exasperated, "to put all of your effort, time, and work into raising a crop— and just watch it burn up out of your control…To have a herd of cows that I spent 40 years developing the genetics on—being forced to sell them because I can't feed them." When producers are faced with the decision of selling their farm or ranch, they not only have to cope with the pressure of losing their livelihood, but also the sense of shame and failure in abandoning a generational history on the land. Producers dedicate their bodies, emotions, time, and money to their operations. They are intimately connected to their land, and to its history. The health of this relationship must be regarded as essential to mental health.

To contextualize, mental health is worsened by the other health conditions in the syndemic, and worsens them in turn: "major depression is much more common in patients with medical conditions like cardiovascular disease, diabetes, and cancer than in the general population, especially among people who have multiple psychobiological effects of poverty" (Singer et. al 2017, 945). If someone is depressed, they are less likely to seek treatment for other health conditions.

Poverty and Healthcare Access

As agribusiness extracts wealth out of rural communities, residents are left with little income, and minimal social services to support needs—most importantly, healthcare. There is a mountain of evidence linking poverty and negative health outcomes and rural areas have, on average, higher poverty than urban. Montana is no different (see figure).

Cancer

Prostate, Non-Hodgkins Lymphoma, brain, and kidney cancers are associated with pesticide use; in Montana, there are higher-than-average rates of prostate and kidney cancers, suggesting a relationship—especially when the ten counties with the highest incidence of cancer are majority agricultural land (Bassil et. al 2007; NIH 2018).[47] Further study is necessary to provide a causal link between the state's higher rates of cancer and pesticide use, however.

Summary

Although the exact biological and psychological mechanisms that cause these syndemic factors to worsen each other haven't been explicitly detailed, this overview provides a basis for future research into the syndemic, so that targeted interventions can be designed that holistically

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[47] Due to small samples sizes in the less common types of cancer, I used overall cancer incidence. For the most common of pesticide-related cancer, prostate, 8 of 10 top counties were majority agricultural land. Montana has a higher rate of cancer than the national average, primarily due to prostate cancer.

and simultaneously address rural health. For now, it is clear that industrial agriculture has systemically affected rural Montana health in intersecting ways. As Quinn & Carlisle (2019, 3) assert, "unless we begin to change this system, these statistics will continue to rise, with disastrous consequences for our health, our livelihoods, and our planet."

CHAPTER 5: A REVITALIZED COMMUNITY

"The rival frames of Progress and Tradition did little to help my community of Big Sandy sort out what was and was not valuable among the competing visions of rural economy being debated and experimented with in the postwar years…to this day, pundits concerned about economic decline and political turmoil in places like my hometown frequently offer one or the other of these basic prescriptions—either 'go back to the good old days' or modernize. Tragically, we are badly missing the point."

--Bob Quinn

"We're going to have to question the very concept of agriculture, and the bundle of assumptions that travel with the English word farm. *What is the objective of this activity? To convert plants into money? Or to foster the health of all beings?*

--Liz Carlisle

Given the comprehensive health effects of industrial agriculture, there is a pressing need for an alternative—but what? And how can an alternative be viable against the controlling economic and governmental powers at play? Fortunately, there are decades of efforts across Montana and nationwide that lay a path forward.[48] Scholars and agricultural producers alike look to an evolution, a synthesis of tradition and new ideas that takes the best practices and cultural beliefs of the past and implements them with new technology and methods designed to withstand the turmoil and uncertainty of globalism, modernism, and the looming doom of climate change. There is no nostalgia for a Jeffersonian rural idyll, with its oft-forgotten problems of domestic abuse, inequality, racism, and colonial injustice; there is skepticism of the biggest and shiniest and most convenient.[49] From academics to fourth generation ranchers, there is a collective realization in the value of community support and collaboration, of shared goals and desires in seeking a democratic and equitable system, and above all—of the need to respect and care for the land. This system, under the umbrella of regenerative organic, is not only better environmentally,

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[48] Montana has a longer organic history than most states, becoming just the fourth state to create an organic certification in 1985 (Carlisle 2015).

[49] It is impossible to separate past American agriculture from land displacement and exploitation of labor.

but it leads to less processed, healthier foods, is more financially stable and lucrative for producers and their communities, and can bring jobs and value back into rural communities— revitalizing them and bettering mental health in the process. Basically, in a more equitable system with better profit margins to operate within, there is much less pressure on the producer, and thus lower stress and more room to experiment with new ideas. And, when the land is thought of as a partner in flourishing, rather than an object to mine income from, the community becomes a healthier place.

New Growth

Regenerative organic agriculture is more than a mere avoidance of synthetic fertilizer and pesticides—it entails a holistic suite of practices that manage the land and its health for future generations, rather than short-term profit, with the ultimate goal of "thriving communities, meaningful work, healthy land" (Quinn & Carlisle 2019, 11). It employs soil building tactics like rotation and cover cropping in farming and adaptive grazing in ranching and follows the principles of soil health: minimize disturbance, maximize diversity, maximize living roots, maximize cover and integrate livestock (Wolfe 2022). With such a slow, environment-building process, "the horizon is long," and the process stretches backwards to ancestors and forwards to the next generation (Carlisle 2022, 13).

Why organic? If producers can overcome the challenge of shifting from conventional to organic practices, organic is more lucrative.[50] Organic prices have remained stable in recent years while global commodities have plummeted (Schweitzer 2022). And, more than just growing organically, it matters *what* you grow. Some producers engage in intercropping, or the

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[50] There is a bureaucratic and time-consuming process to convert to organic, and producers have to not use chemicals for three years on their fields before receiving certification—a lengthy time gap where they aren't receiving organic prices. With the limited margins of industrial ag, it can be difficult to make the switch.

practice of growing different species beside each other in the same field; this can boost the growth of both crops as they lend each other nutrients and block out weeds (Quinn & Carlisle 2019; Carlisle 2022).[51] In the climate volatility of today, growing organic provides a leeway of choice, allowing producers to choose drought-resistant crops rather than varieties chosen by corporations that only prosper in ideal conditions.[52] Many non-conventional varieties, like Kamut, are also more nutritious and can provide physical health benefits. It's a win-win. Quinn (2019, 140) also questions the current system of importing fruit from tropical areas and the idea that tropical countries simply "do it better," promoting the growth of native trees and other fruiting plants like currants, plums, chokecherries, serviceberries, and crab apples. Shifting to local produce would help reduce the environmental and financial costs of transportation, refrigeration, and marketing. Being adapted to the harsh environment, native plants are also easier to grow and are beneficial to local ecosystems; as a whole, biodiversity in cropping is better for soil, crop resiliency, animal life, and nutrition. Regenerative organic looks more like farming in relationship to the land, rather than a one-sided extraction of value.

It is important to emphasize that for this transition to be successful, it will take more than the implementation of a few sustainable practices like no-till or cover cropping. Carlisle (2022, 13) asserts that we have to think of regenerative agriculture "not as a menu of discrete, isolated practices from which one could pick and choose and then tally up into a sustainability score," but rather, "as a way of life."[53] And for Carlisle, this means looking to the holistic traditional

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[51] For example, the four sisters approach of planting corn, beans, squash, and sunflower amongst each other has proven more productive than each plant alone.

[52] Bob Quinn's Kamut, an ancient grain, while producing lower yields than modern wheat in ideal weather, is more productive in drought, which is essential as drought becomes more common. 2021 was Montana's 4th driest year on record (Murray 2021).

[53] Carlisle(2022b) does support these efforts as important steps, but asserts that they must be paired with 'wrap-around' services that support producers in filling out complicated paperwork and other requirements; else, the program might only benefit those with the resources to deal with extra costs. A thesis on the Conservation

Indigenous agricultural practices and practitioners that the modern organic movement is based

upon. She links the harmful extraction of industrial agriculture to larger process of extraction:

theft of Indigenous lands, forced enslavement of Africans, and extortion of immigrant labor.[54]

So, while sustainable farming practices are essential and valuable, we must go further and shift

our "way of relating to land and with each other" (Carlisle 2022, 176). And ultimately, it comes

down to who is on the land: "the future of regenerative agriculture hinges on whether the people

needed to practice it are afforded stable access to land. The possibility of belonging to a place—

of being intimately connected to lives beyond our own—is central to healing our soils and our

climate…We often point the finger at farm policy for destroying our rural environment…but

immigration policy and racialized incarceration are to blame as well…people were never allowed

to put down roots" (Matsumoto in Carlisle 2022, 161). So, in addition to the enactment of a

series of sustainable agricultural practices, there needs to be a shift in priority from profit and

production to equality, fairness, and a holistic view of community health.

  PEAS Farm. April 2022.

  Nestled in the brown hills by Rattlesnake Creek in Missoula, PEAS farm is seeking to

integrate the Mandan/Hidatsa/Arikara Four Sisters approach into one of their fields. On a

cloudy and wet April day, Caroline Stephens—lecturer at the farm—talks about her work with

Ruth Plenty Sweetgrass-She Kills, director of Food Sovereignty at Nueta Hidatsa Sahnish

College, with whom she has been planning this project. We have just eaten a rich soup—an

Indigenous recipe with turkey and corn and beans—as an introduction to the day's lecture about

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Stewardship program in Montana, which provides compensation for producers that enact practices like no-till or cover cropping, reported positive environmental benefits but difficulties with reporting and a bureaucracy unattuned to local needs (Ellis 2019).

[54] There is also a long history of displacement from agricultural land. 98% of black farmers lost their land in the last century (Carlisle 2022). In addition, Judy Blunt (2021) detailed the realities of her community in Eastern Montana: racism, spousal abuse, child abuse, and "nobody's business" attitude to neighbors' wrongdoings.

food sovereignty. Indigenous food sovereignty is the theme of this week—a series of three events covering the efforts of students and scholars in Montana that are rethinking food systems to reclaim some of the health, power, and cultural practices lost to colonialism.

To preface her talk, Sweetgrass-She Kills details her tribe's history of agriculture, and the harmful impact of the Garrison Dam, built in 1953, as it flooded their river bottom community. She parallels the relative health and sovereignty they had before the dam with the farming struggles atop the windswept hills and poor soil they were forcibly removed to—and the diabetes and obesity that followed suit.

Sweetgrass-She Kills is intentional about expressing the mindset behind this farming practice, urging the group of students around her to imagine it is spring in her tribe's valley; she relates the rushing Rattlesnake Creek behind her to the Missouri her tribe used to plant along. "Listen to the geese," she adds, gesturing to the birds honking their way by us, "that's how you know it's time to plant." She goes on: "we see corn as a small child," and then begins singing a corn song.

Caroline, Ruth, and a student intern then go into the details of the Four Sisters arrangement: sunflowers on the outside, a checkerboard of beans and corn, squash bordering each checker.

Later, in the warmer hoop house, Sweetgrass-She Kills pulls out jars of seeds with care: a smattering of squashes, purple and red and multicolor corn kernels, oddly shaped beans, a few dark sunflower kernels. As students gather around to look at the rainbow of potential food, she explains different uses for each variety—and laments the many she doesn't have access to.

This project is on the cutting edge of the new work that Liz Carlisle is calling for: close relationships that attend to Indigenous wisdom and that care for the Earth. It is somewhat untraditional—using plains tribes' agriculture in a western Montana mountain town—but Stephens point out that the volatility of climate change puts the PEAS farm in a "position to interpret" practices in new ways. Though the success and usefulness of this project is undetermined, it is a valuable first step in reforming agriculture.

Sustainable Community Systems

Rethinking the food system must go beyond growing food better—it has to reach consumers in a sustainable and healthy way as well. At the Montana Farmer's Union, Walter Schweitzer builds upon Montana's cooperative history to create community collaboration that wrests control of processing from corporations and returns it to locals; it is, as Schweitzer puts it, "a way to control your own destiny." Mirroring his ancestors' efforts of rural telephone and electric cooperatives, Schweitzer has recently worked with ranchers in central Montana to create a meat processing cooperative, the Premium Processing Co-op. Meat processing nationally currently forms a sort of bottleneck, as demonstrated by the supply chain issues early in the COVID pandemic when producers were unable to get their meat processed and were forced to euthanize animals (Hettinger 2020a, b).[55] The Premium Processing Co-op allows producers to avoid supply complications by cutting out corporate middlemen, by keeping money locally, and by becoming more self-reliant and sustainable. The co-op speaks to a larger pattern of community processing operations in Montana that are taking a "collaborative, syststems-level approach" to food; by opting out of the complicated global food market and connecting directly to Montana producers, processors like the Mission Mountain Food Enterprise Center can provide

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[55] Thanks to Schweitzer and other efforts, however, meat processing in Montana doubled last year, according to the Montana Department of Livestock (2022).

quality, affordable local food to people (Wolfe 2020). For these processors, building community is just as important as building a strong business and they represent a pooling of power that allows their member to access markets and enact business models that they would not be able to alone. David Oien's Timeless Seeds and Bob Quinn's Montana Flour and Grains are two larger-scale examples of Montana companies that have gathered producers together to grow organic crops, process crops locally, and then find markets to sell directly to—with positive benefits for the area.[56] Instead of looking for the cheapest labor and cheapest food, these cooperatives ensure that their neighbors and friends get fair value along the supply chain. As Schweitzer sums it up, "milling our own wheat and making our own bread and putting a price on that bread that makes us a little money and our neighbors will buy it. And all the way along the line you're creating jobs for your neighbors." New rural jobs, increased profits, community collaboration, better nutrition: these are all positives for mental health. [57]

Accomplishing Change

Is this proposal unrealistic? How can we get conservative farming or ranching families to embrace radical, unorthodox ideas, when their identities and history are so tied in their labor and land? Jaicks (2022b) posits that "feelings of loss and dispossession, feeling like a failure, the masculine identity, all of these burdens get put on…whatever issue is on the table that is threatening their livelihood," like grizzly bears or wealthy newcomers buying up land; she tries to explain that these commonly blamed issues are "representative of a whole host of other things," that Jaicks hopes to name and work through with the rancher: "sometimes information doesn't change reality, but at least makes it clear to you" so that steps can be taken towards a

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[56] Quinn also hopes to develop a "network of regional centers that could all contribute to comparative studies on major research questions but also study problems specific to their regions" (Quinn & Carlisle 2019, 205).
[57] Reduced poverty, reduced isolation, reduced harmful health conditions, to put it in terms of Montana suicide factors.

solution. So, might these worries and anxieties get redirected to addressing systemic issues that

are putting agriculture on volatile footing, rather than a small and easily blamable component of

systemic problems? Quinn is hopeful: "I'm not pushing uphill quite as hard against so much

tradition that says there's no reason to change anything. Thirty years ago, fewer people had

already gone broke. Everything was really rosy with industrial ag" (Wolfe 2021b).[58]

Carlisle (2022b), who has worked a wide spectrum of people in Montana, believes the

basis of the organic transition is relationships; not the ecological relationships that get so much

focus, but those "critical human relationships of cooperation and trust" that allow different

people to collaborate and see eye-to-eye. Like the generationally slow organic soil-building

process, the process of changing basic cultural ideas about production must be taken one step at a

time, and remain realistic.[59] This comes from both sides: those that want a return to native

prairies with bison and a tearing down of property fences and those who are reluctant to change

generational agricultural practice and are desperate to preserve the family farm/ranch must both

take a small first step—one that might be more similar than different.[60] Jaicks (2022b) asserts

that productive change first comes through a unifying issue. In Montana, a state where nearly

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[58] Of course, there are also systemic barriers to change, and Liz Carlisle (2022b) sees the biggest barriers as being economic and political, not cultural. A significant aid would be a shift in research priority: in 2021, less than 1% of USDA research funding went to organic research, even though organic food makes up around 4% of food sales (Wolfe 2021). In an ideal world, organic spending would be higher than its current proportion of sales, and land grant colleges would focus more on benefitting their local constituents disadvantaged in the system rather than large corporate farms. Similarly, a shift in subsidy policy would be beneficial. As mentioned in the previous chapter, subsidies currently prop up corn and soy monocultures, so a shift to funding nascent organic operations would greatly foster a transition to organic, and also help lower the price of organic—which is currently a barrier to many lower income people.

[59] Though Jaicks (2022b) would prefer to see bison on the landscape, she recognizes that adaptive, sustainable ranches keeps wildlife corridors open, prevents subdivision development, and sequesters carbon.

[60] In a bad example of communication, the American Prairie Reserve has irritated many local ranchers in its attempt to buy local ranch land for the formation of contiguous wild prairie. Jaicks (2022b) calls their approach terrible because it is hierarchical and top-down. Judy Blunt (2021) reports that her ex-husband, who lives near the APR, would "sell to Lucifer before them," and that both groups are bad at listening to each other.

everyone is touched by the harm of suicide, a shared desire for reduced suffering might be that

issue.

CONCLUSION: CULTURAL NARRATIVES

"You can't just start over like nothing ever happened. You can't befriend a dead man. You can build a river to modern specs, but you can't rebuild one that's gone. What came before carries over, like water topping a dam. At what point do you decide to write off the imperfect—a blood tie, a landscape—and turn away? What's downstream of disappointment?"

-Brad Tyer

"And so we shared this secret in the presence of ghosts, in wind that called forth the muttering tepees, the blowing snow, the white air of the horses' nostrils. The cottonwoods behind us, their dead white branches angling to the threatening clouds, sheltered these ghosts as they had sheltered the camp that winter. But there were others, so many others"

--James Welch

"We must glean the stories from the past, then begin to compose our own."

--Ken Egan

In my time trying to get to the bottom of suicide in Montana, I heard the 'cowboy-up'
mentality blamed again and again. Perhaps it is a testament to the enduring impact of agriculture
on the Montana psyche. It also speaks to the power of cultural narratives in shaping mental
behavior, and the myth of the self-reliant, heroic, in-control-of-his-own-destiny cowboy is
central to the American West.[61] It has clashed violently with the monolithic power of
agribusiness as male producers struggle and fail to fight a hostile system alone—and blame
themselves when they do. Ramirez-Ferrero (2005) asserts that male farmers tie their identity and
self-worth into their land, their occupation, and its success—and this is why they suffer such
disillusionment when the farm fails. He (Ibid, 39) argues that women were less attached to
farming, that "it was less integral to their identities," but is this so? Julia Watson (in Egan 2003,
34) points out that women in Montana merely had different priorities: "an emphasis on family
and domestic life, on the importance of small communities, on survival rather than conquest, on

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[61] Judy Blunt (2021) described the men in her area as "extolling the heroics of the cowboy myth," relating a story
where her father, who normally wore a baseball cap while farming, would switch to his cowboy hat when he saw a
visitor approaching. Blunt asserts that they "lived their own mythology and that's what made it worth it when
nothing else did."

generational networks, and on pleasure in place." The Women as Community Builders Oral

History Project, conducted in 1986-1987 by Montana women historians, confirms the essential

roles women played in Montana life; in the oral histories, women like Nora Hanson of Melville

detail their time organizing community events—which were often centered around the local

schoolhouse—promoting economic growth through organizations like the Cowbelles the Farm

Bureau, and promoting heritage through groups like the Sons of Norway, and the building of

healthcare access through hospitals or mental health awareness.[62] Herein lies potential

justification for historic preservation work. Schoolhouses, once so central to community

gathering, can be described as a site of positive place identity for locals. Chere Jiusto, executive

director of Preserve Montana, promotes preservation as a way to provide "tangible" history for

community members, allowing them to gather around shared history in a "more engaging and

active" manner because the "living aspect" of physical history generates greater relevance for

people. Jiusto (2021) describes this tangible history as tying into cultural narratives: "if we lose

the story, we lose meaning." And though Jiusto recognizes that those with ancestral connection

to the landscape have the strongest emotional ties, she believes that something like a schoolhouse

can provide a "general point of connection" that allows residents new and old to feel grounded

and a sense of belonging.

A reading of Montana women authors like Judy Blunt (2002) and Mary Clearman Blew

(2008) builds upon this understanding, demonstrating the visceral connection women have to

their land and to their occupations—they just have minimal say in the business, and no

ownership of the land. Ramirez-Ferrero (2005, 40) reports that unlike men, who hid their

business troubles from neighbors out of shame, women, "motivated to act by the anger they

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[62] Supporting this variety of activities and organizing is volunteer effort, which was critical given the limited resources in the state.

experienced watching their families suffer" were more proactive: "women will pick up the telephone and call and say, hey, we're having problems and here are the facts. And the women will talk to each other. They don't go out and…spread doom and gloom."

Agricultural communities have many traits, good and bad, and it is clear that an emphasis on long-held cowboy or homesteader self-reliance is not an answer to rural Montana's current crises. Perhaps listening to the voices of women, Indigenous people, and other alternative voices who have always touted the power of community collaboration in the face of challenges is a productive step forward in addressing mental health stigma and alleviating some of the ongoing farm crisis.[63]

A Syndemic Conclusion

How does all of this practically apply to suicide prevention? When industrial agriculture is linked to mental health in rural Montana, a rethinking of agriculture is part of a rethinking of mental health. And in a syndemic landscape framework, repairing the damages of industrial agriculture becomes part of the suicide prevention toolkit. Transitioning to organic, increasing local food processing capacity, bringing meaningful jobs to agricultural towns, preserving the history and land of rural Montana: all these actions can contribute to mental health. Maybe going forward, legislators and public health workers alike can build on Montana's less-highlighted strength—community collaboration—to implement law and policy that addresses suicide holistically, with QPR and emotional intelligence building treated as importantly as agricultural reform and supporting connection to place. The effort to heal Montana mental health will be

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[63] Petersen, administrator of the Richland County Health Department, credits a large part of the success of the Communities in Action group to out-of-state AmeriCorps members who can provide a new, outsider perspective on issues and who "try to listen" to issues at hand. She emphasizes the need for collaboration: "we need one another to be successful in tackling big issues." Much like peer support is an answer to prevent suicide, community support is an answer to solving the community-wide issues of rural Montana.

slow, generational—much like the effort to heal the land and our food systems. But it will be worth it.

Future Research

This thesis proposes a new paradigm for thinking about suicide prevention by attending to how relationship to land and culture can influence and become intertwined with other factors that contribute to suicide risk. Though preliminary study and theory suggests that the syndemic landscape might be useful in deepening understanding of suicide in Montana, more research is necessary to provide a causal link for the multiple assertions of this paper. First, how do the diseases in the potential rural agricultural syndemic interact? An essential component of syndemic theory is disease interaction, so there will need to be a study of how depression or isolation biologically and/or psychologically aggravate diabetes, cancer and social conditions like poverty, and vice/versa. This study might be accomplished by utilizing ethnographic methods like those of Emily Yates-Doerr (2015) in *The Weight of Obesity*, where she combines participant observation of community members in their homes, food markets, and during healthcare visits with a discussion of larger economic patterns and cultural history; this ultimately provides a comprehensive and localized view of a community and the ways that health is unique to an area and people; research on specific biological interactions like those discussed by Singer et. al (2017) will be necessary to supplement ethnographic observation. Second, the link between health and culture and land should be empirically measured. William Dressler's (2017) concept of cultural consonance provides an excellent framework to quantitatively measure this. Basically, the researcher would measure an individual's consonance, or fit, with the community's definition of heritage or cultural values, such as connection to land (as defined through interviews); the consonance would be compared against a health measure like depression

to study correlations between the two. If there is a correlation, the research would suggest the relevance of heritage/land wellbeing to bodily wellbeing. Once evidence has been established that supports the proposals of this thesis, the syndemic landscape might be fruitfully incorporated into suicide prevention approaches in Montana, with hopefully beneficial effects for those suffering.

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Elevation of Montana Cities and Towns (mt.gov)

Altitude to Oxygen Chart (hypoxico.com)

FRSAN (mt.gov)

Resource Clearinghouse - Western Region Agricultural Stress Assistance Program (farmstress.us)

MT Farm and Ranch Stress Resource Clearinghouse - Extension Wellness | Montana State University (msuextension.org)

Poverty (usda.gov)
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Prices_Received_and_Paid_2007-2017.pdf (usda.gov)
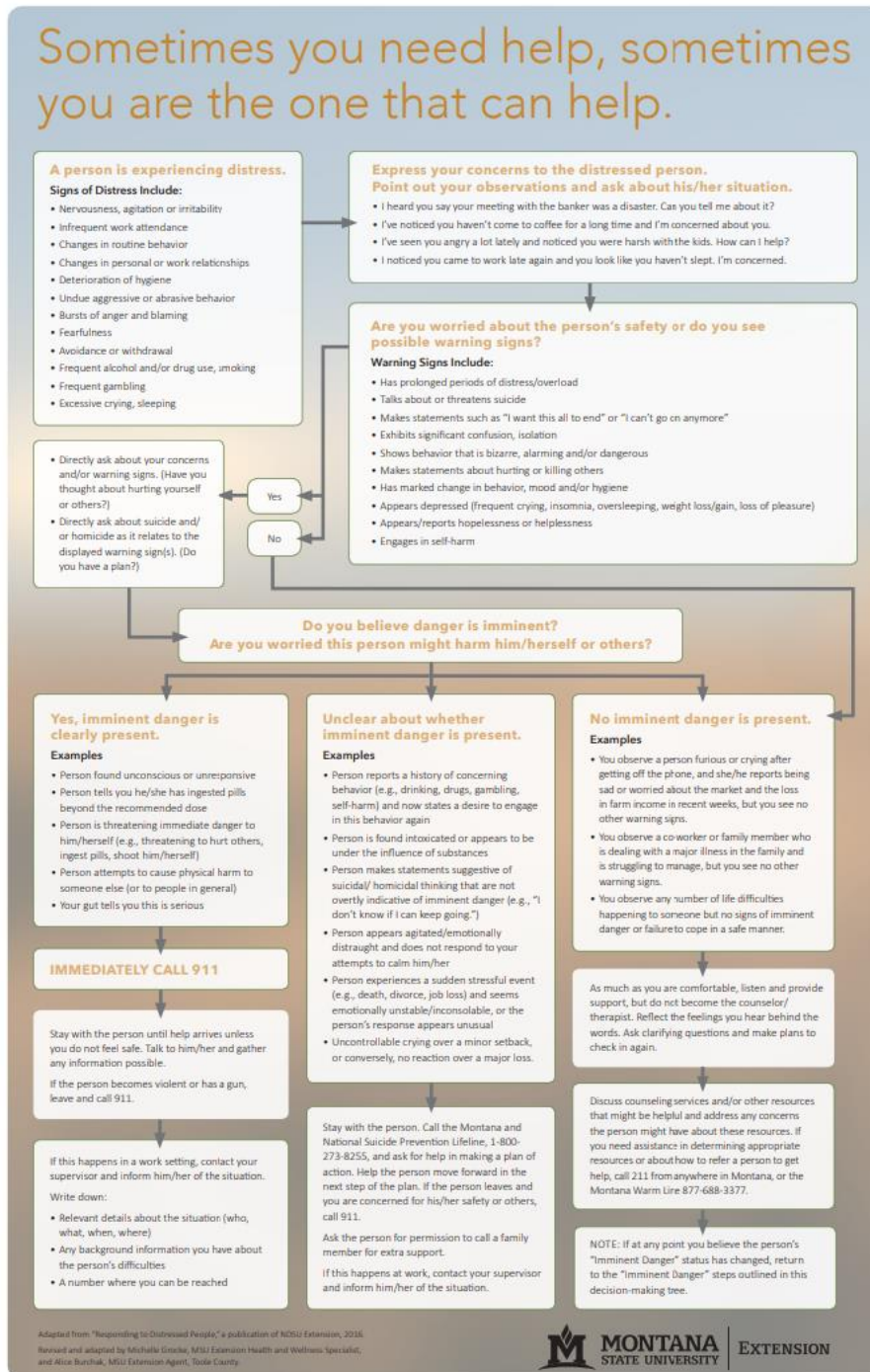
2017 Census of Agriculture Data Now Available | USDA

Preventable Deaths in Montana: Heart Disease and Stroke Deaths by County (mt.gov)

Interactive Atlas of Heart Disease and Stroke Tables (cdc.gov)

Appendix A:

Suicide Prevention Pamphlet Example

Appendix B:

Interviews

Chere Jiusto 12/3/2021

Jiusto's career in cultural resources and public history in Montana has spanned over two decades. She served as architectural historian and coordinator of the MT SHPO's National Register program from 1990 to1998, and spent two years overseeing MT SHPO's community preservation and state survey program from 2000 to 2002. She also operated a private consulting business from 1988 to 1990, and again from 1998 to 2000, completing broadly diverse projects including community surveys, historic property nominations, historic research and interpretive writing. She has extensive background with cultural resource documentation on every level, including historic properties, determinations of eligibility, cultural landscapes, traditional cultural properties, Section 106 compliance, Section 110 projects, National Historic Landmarks, reconnaissance surveys, preservation planning, threatened site planning, mitigation proposals and heritage education.

Karl Rosston 12/3/2021

Karl Rosston is the Suicide Prevention Coordinator for the Montana Department of Public Health and Human Services. He provides evidenced-based programs to all Montana secondary schools, implements the State Suicide Prevention Plan, supports the Montana Suicide Prevention Lifeline, implements firearm safety programs and statewide media campaigns, provides suicide prevention trainings, and coordinates suicide prevention efforts around the state. Karl is adjunct faculty at the Montana Law Enforcement Academy and a nationally certified trainer in QPR and Mental Health First Aid.

Judy Blunt 12/31/2021

Judy Blunt spent more than 30 years on wheat and cattle ranches in northeastern Montana, before leaving that life to attend the University of Montana. Her book of poems, Not Quite Stone won the Merriam-Frontier Award, and was published in 1991. Her best-selling memoir, Breaking Clean, was published by A.A. Knopf in 2002 and met with wide critical acclaim. Her essays explore the complexity of growing up a girl in cowboy country. She challenges the Hollywood mythology but honors the ranching community, paying tribute to a West few people know from the inside out. In her current research, she documents turn-of-the-century homesteaders' narratives.

Ken Egan 2/4/2022

Ken Egan is a former literature professor at Rocky Mountain College. In addition to his academic works on Montana literary criticism and history, he served as the executive director of Humanities Montana.

Walter Schweitzer 4/14/2022

Walter Schweitzer is the president of the Montana Farmers Union. In addition to his ranching operation, he operates a small business in rural Geyser, Montana.

Jess Fuhrman 4/21/2022

Jess Fuhrman is the crisis care coordinator at Eastern Montana Community Mental Health Center.

Hannah Jaicks 5/1/2022

Hannah Jaicks is an interdisciplinary scientist who specializes in using psychology to develop stronger avenues of communication and inclusion amongst the public, decision makers and scientists around issues of conservation and sustainable development. Her research has taken her throughout the Greater Yellowstone Ecosystem for the past decade, assisting efforts to ensure that the working landscapes of the region continue to produce successful farming and ranching as well as healthy and abundant wildlife populations.

Liz Carlisle 5/11/2022

Liz Carlisle is an Assistant Professor in the Environmental Studies Program at UC Santa Barbara, where she teaches courses on food and farming. Born and raised in Montana, she got hooked on agriculture while working as an aide to organic farmer and U.S. Senator Jon Tester, which led to a decade of research and writing collaborations with farmers in her home state. She has written three books about regenerative farming and agroecology: Lentil Underground (2015), Grain by Grain (2019, with co-author Bob Quinn), and most recently, Healing Grounds: Climate, Justice, and the Deep Roots of Regenerative Farming (2022). She is also a frequent contributor to both academic journals and popular media outlets, focusing on food and farm policy, incentivizing soil health practices, and supporting new entry farmers. She holds a Ph.D. in Geography, from UC Berkeley, and a B.A. in Folklore and Mythology, from Harvard University.

Brittney Petersen 5/12/2022

Brittney Petersen is the Administrator of the Richland County Health Department (RCHD). Brittney joined RCHD in January 2020. Her primary responsibilities are to ensure the vision of the department is realized by mobilizing the community, identifying resources, and overseeing the implementation of the department's strategic goals. Brittney has worked for several member organizations, including the Colorado Community Health Network, where she was the Covering Kids and Families Project Director. Brittney also worked for the Association of State and Territorial Health Officials as a policy analyst. She earned her bachelor of science degree from Montana State University in community health and her masters of science degree from Regis University in health services administration.

Heritage:

What do you do? How is your occupation 'heritage'? What is heritage to you?

Tell me about Montana's heritage.

How is it distinctive from other places?

Is Montana heritage changing; if so, how so?

What is the role, and value of heritage, and to whom?

What do you think is the future of heritage in the state?

Do any issues stand out to you as significant, and why?

Do you see a difference in how heritage valued across different age groups?

Do you think heritage is the same across the state?

Is it affected by residents moving to, or from the state, and if so, how?

Public Health:

What do you do?

What are the most prevalent issues facing public health in Montana? What about for mental health specifically?

Does mental health care look different in Montana; if so, how?

Has mental health treatment changed in the last few decades?

What do you see as the most effective programs or treatments in the state right now? What would you like to see implemented?

What do you see as the cause for mental illness? Do you see any causes as uniquely Montanan?

What is your approach to suicide prevention?

What do you see as the cause for increased mental illness in the state?

Agriculture:

What is the outlook for Montana agriculture? What are the biggest challenges right now?

What steps are being taken to provide solutions?

Why is agriculture important to Montana? Are family farms important?

How does agriculture relate to health?

How do you balance tradition and progress in agriculture? Are conservation methods viable?

Appendix C:

Montana County-Level Suicide Charts

Simple Bar Mean of Age-adjusted suicide rate, 1999 to 2016 by County defined as small metro (<250k) micro (10k-50k), noncore (<10k)
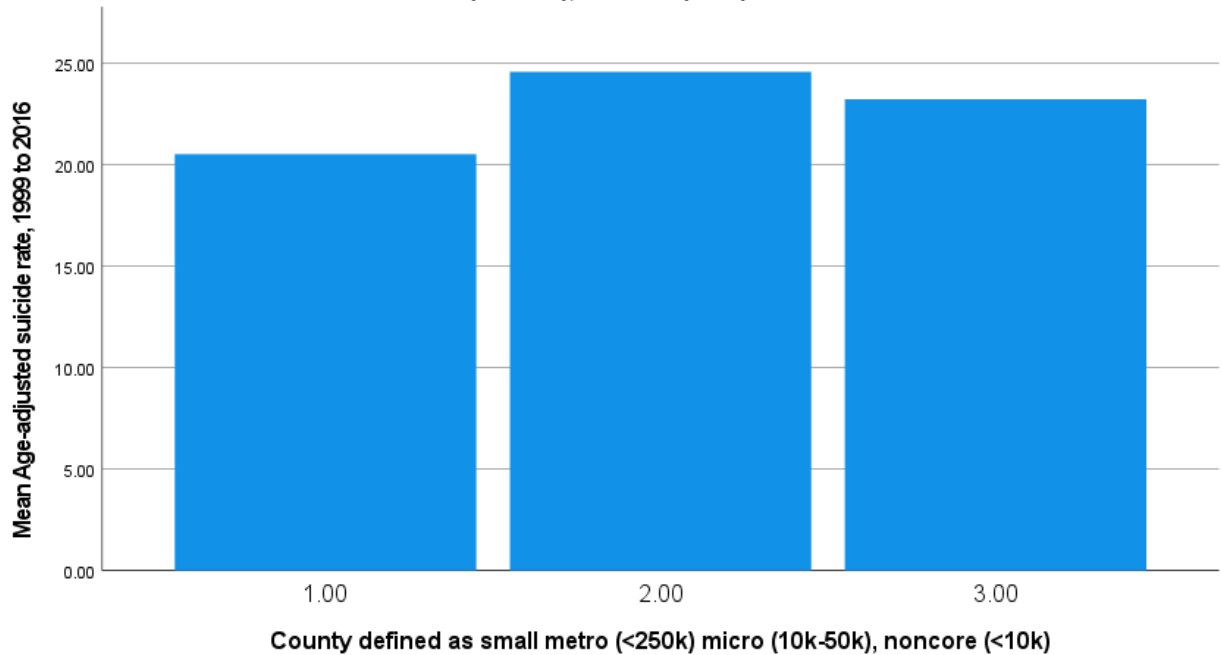
This chart demonstrates the 1999 to 2016 age-adjusted rate of suicide by population classification. Metro areas have lower rates of suicide than micropolitan and noncore areas.

Simple Bar Mean of Suicide MTDPHHS mortality data 2009-2018 by County defined as small metro (<250k) micro (10k-50k), noncore (<10k)
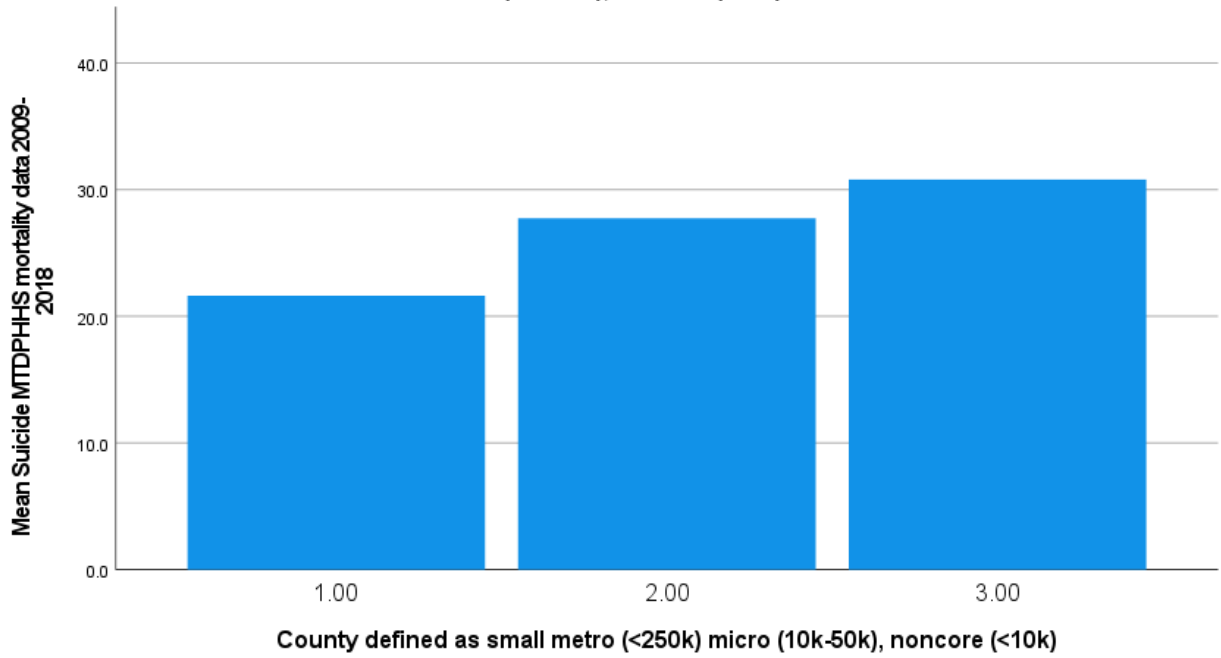
This chart illustrates the 2009-2018 age adjusted rate of suicide by population classification. Notice the increase in noncore areas.

Simple Bar Mean of PCTFarmLand by County defined as small metro (<250k) micro (10k-50k), noncore (<10k)
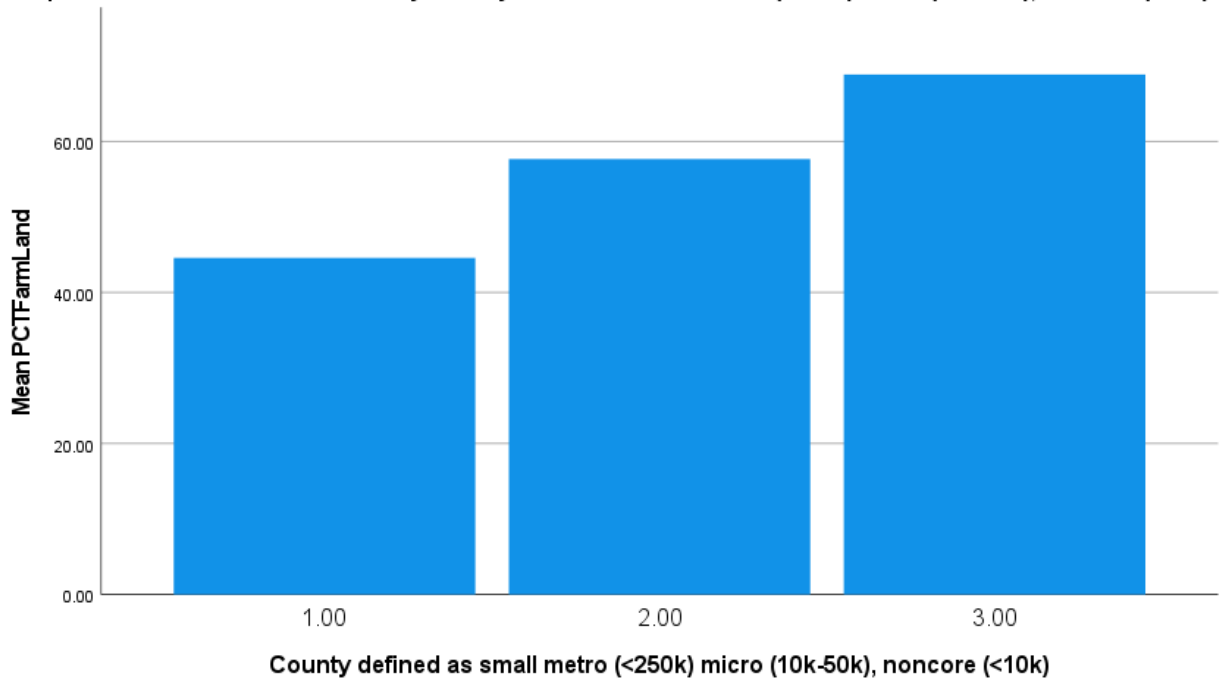
This chart illustrates the percentage of farmland in each county by population classification.

Unsurprisingly, this is higher in noncore areas.

Correlations

		Suicide MTDPHHS mortality data 2009-2018	Age-adjusted suicide rate, 1999 to 2016	PopChange5 0to20	ObesityPct	CancerIncidence	ShareAgLabor	ShareAgGDP	PCTFarmLand	Divorce Rate 2015 to 2019	Ratio of mental health providers in population	Average of poverty rate, 2006 to 2019	People per square mile, 2020	Percentage of suicides by firearm, 1999 to 2016	Percentage of population Native American, 2020	Percentage of population veteran, 2020	Kilojoules of solar radiation per square meter, yearly avg	Altitude of city seat
Suicide MTDPHHS mortality data 2009-2018	Pearson Correlation	1	.886**	-.409*	.163	.180	-.026	-.128	.007	-.025	-.018	.231	-.199	-.229	.181	.042	-.008	-.173
	Sig. (2-tailed)		.000	.022	.381	.332	.890	.493	.971	.893	.924	.211	.284	.216	.330	.822	.966	.351
	N	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Age-adjusted suicide rate, 1999 to 2016	Pearson Correlation	.886**	1	-.129	-.076	.070	-.307	-.274	-.185	.250	.235	.247	-.080	-.133	.178	.079	.188	-.094
	Sig. (2-tailed)	.000		.435	.645	.670	.057	.092	.259	.125	.150	.130	.628	.418	.279	.631	.252	.603
	N	31	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33
PopChange50to20	Pearson Correlation	-.409*	-.129	1	-.400**	.059	-.560**	-.530**	-.506**	.177	.329*	-.168	.589**	.104	-.039	.054	.098	.087
	Sig. (2-tailed)	.022	.435		.002	.664	.000	.000	.000	.191	.027	.216	.000	.531	.778	.694	.472	.629
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
ObesityPct	Pearson Correlation	.163	-.076	-.400**	1	-.001	.165	.060	.552**	-.255	-.302*	.404**	-.315*	-.338*	.554**	-.326*	-.332*	-.596**
	Sig. (2-tailed)	.381	.645	.002		.996	.224	.660	.000	.058	.044	.002	.018	.035	.000	.014	.012	.000
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
CancerIncidence	Pearson Correlation	.180	.070	.059	-.001	1	.039	.024	.085	-.025	.137	-.072	.054	.092	.003	.084	.133	-.210
	Sig. (2-tailed)	.332	.670	.664	.996		.778	.859	.534	.856	.371	.598	.694	.579	.981	.537	.329	.240
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
ShareAgLabor	Pearson Correlation	-.026	-.307	-.560**	.165	.039	1	.847**	.489**	-.217	-.643**	.052	-.492**	.075	-.146	.000	-.125	-.081
	Sig. (2-tailed)	.890	.057	.000	.224	.778		.000	.000	.108	.000	.702	.000	.652	.283	.998	.358	.654
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
ShareAgGDP	Pearson Correlation	-.128	-.274	-.530**	.060	.024	.847**	1	.335*	-.166	-.539**	.111	-.462**	.020	-.157	-.024	-.079	.038
	Sig. (2-tailed)	.493	.092	.000	.660	.859	.000		.012	.221	.000	.414	.000	.903	.247	.862	.563	.832
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
PCTFarmLand	Pearson Correlation	.007	-.185	-.506**	.552**	.085	.489**	.335*	1	-.440**	-.404**	.078	-.302*	-.174	.242	-.364**	-.113	-.433*
	Sig. (2-tailed)	.971	.259	.000	.000	.534	.000	.012		.001	.006	.568	.024	.289	.073	.006	.407	.012
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Divorce Rate 2015 to 2019	Pearson Correlation	-.025	.250	.177	-.255	-.025	-.217	-.166	-.440**	1	.261	.068	.156	-.212	-.066	.378**	.052	.326
	Sig. (2-tailed)	.893	.125	.191	.058	.856	.108	.221	.001		.083	.616	.251	.196	.628	.004	.704	.064
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Ratio of mental health providers in population	Pearson Correlation	-.018	.235	.329*	-.302*	.137	-.643**	-.539**	-.404**	.261	1	.000	.683**	-.080	-.033	-.115	.062	.119
	Sig. (2-tailed)	.924	.150	.027	.044	.371	.000	.000	.006	.083		.999	.000	.629	.829	.453	.687	.509
	N	31	39	45	45	45	45	45	45	45	45	45	45	39	45	45	45	33
Average of poverty rate, 2006 to 2019	Pearson Correlation	.231	.247	-.168	.404**	-.072	.052	.111	.078	.068	.000	1	-.127	-.388*	.758**	-.142	-.260	-.367*
	Sig. (2-tailed)	.211	.130	.216	.002	.598	.702	.414	.568	.616	.999		.351	.015	.000	.296	.053	.036
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
People per square mile, 2020	Pearson Correlation	-.199	-.080	.589**	-.315*	.054	-.492**	-.462**	-.302*	.156	.683**	-.127	1	-.098	-.075	-.059	.139	.217
	Sig. (2-tailed)	.284	.628	.000	.018	.694	.000	.000	.024	.251	.000	.351		.555	.582	.667	.308	.226
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Percentage of suicides by firearm, 1999 to 2016	Pearson Correlation	-.229	-.133	.104	-.338*	.092	.075	.020	-.174	-.212	-.080	-.388*	-.098	1	-.464**	.187	.055	-.046
	Sig. (2-tailed)	.216	.418	.531	.035	.579	.652	.903	.289	.196	.629	.015	.555		.003	.255	.738	.799
	N	31	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	33
Percentage of population Native American, 2020	Pearson Correlation	.181	.178	-.039	.554**	.003	-.146	-.157	.242	-.066	-.033	.758**	-.075	-.464**	1	-.344**	-.136	-.406*
	Sig. (2-tailed)	.330	.279	.778	.000	.981	.283	.247	.073	.628	.829	.000	.582	.003		.009	.316	.019
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Percentage of population veteran, 2020	Pearson Correlation	.042	.079	.054	-.326*	.084	.000	-.024	-.364**	.378**	-.115	-.142	-.059	.187	-.344**	1	-.038	.193
	Sig. (2-tailed)	.822	.631	.694	.014	.537	.998	.862	.006	.004	.453	.296	.667	.255	.009		.782	.283
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Kilojoules of solar radiation per square meter, yearly avg	Pearson Correlation	-.008	.188	.098	-.332*	.133	-.125	-.079	-.113	.052	.062	-.260	.139	.055	-.136	-.038	1	.658**
	Sig. (2-tailed)	.966	.252	.472	.012	.329	.358	.563	.407	.704	.687	.053	.308	.738	.316	.782		.000
	N	31	39	56	56	56	56	56	56	56	45	56	56	39	56	56	56	33
Altitude of city seat	Pearson Correlation	-.173	-.094	.087	-.596**	-.210	-.081	.038	-.433*	.326	.119	-.367*	.217	-.046	-.406*	.193	.658**	1
	Sig. (2-tailed)	.351	.603	.629	.000	.240	.654	.832	.012	.064	.509	.036	.226	.799	.019	.283	.000	
	N	31	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

This is a county-level correlation matrix of suicide rates and suicide risk factors.