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WHAT ARE SYNDEMICS? AN INTRODUCTION TO CO-OCCURRING EPIDEMICS

People do not live in a vacuum. Many factors influence our choices and experiences, including the environment around us. A growing body of evidence now shows that environmental factors, such as limited access to economic opportunity, limited access to quality health care, and stigma and discrimination, are associated with a wide range of negative health conditions, including substance misuse.

In fact, these environmental factors often increase the risk of not just one, but multiple negative conditions which can potentially lead to clusters of conditions forming in a population. When this occurs, the whole of the negative consequences can be greater than the sum of their parts.

As an example, consider *Los Rios*, a hypothetical Hispanic American community with many first-generation immigrants whose language of origin is not English. The median income of the community is below the statewide average, and the environment presents many barriers to accessing state-funded health and social services, including distance, language, and discrimination. Rates of type 2 diabetes and depression are elevated and continuing to rise, and substance misuse is growing.

In this example, some of the same environmental factors that contribute to high rates of type 2 diabetes in the community also contribute to depression. And one of the negative outcomes—depression—is also a risk factor for substance misuse.

When a single negative outcome—such as depression—becomes prevalent enough within a community, it can be considered an *epidemic*. When multiple epidemics negatively interact with each other, they can be considered a *syndemic* (i.e., synergized epidemics).[i] In fact, our

hypothetical *Los Rios* has many similar elements to the real syndemic[1] of violence, immigration, depression, type 2 diabetes, and abuse (VIDDA).[ii]

This resource offers an introduction to what syndemics are and why they are important to consider. It also explores opportunities for developing a "syndemic-informed" approach to substance misuse prevention. While these opportunities may be limited for now, new opportunities are likely to emerge as research on syndemics expands.

DEFINING SYNDEMICS

A syndemic exists when the following three criteria are met:[iii]

- **Epidemic concentration:** Two or more negative health conditions cluster within a population.
- **Environmental influence:** Social determinants of health (SDOH) and inequities within the relevant SDOH contribute to this clustering.
- **Epidemic interaction:** The clustered conditions interact with each other and lead to excess health burdens and disparities.

Syndemics do *not* require that their component epidemics have shared risk factors. It is likely that they will have at least *some* shared factors, but it is not guaranteed.

What is required, however, is that the growth and clustering of the component epidemics are the product, to some degree, of shared environmental inequities— such as a lack of high-quality primary care providers.

Let's return to hypothetical *Los Rios*. Variations in the SLC16A11 gene, common among Hispanic populations, increase the risk of developing type 2 diabetes, although these variations have no direct influence on substance misuse risk.[iv] Acculturation stress,

Syndemics, SDOH, and Substance Misuse Prevention

Substance misuse prevention recognizes the importance of identifying and addressing the environmental inequities that can be root causes of substance misuse.

Syndemics represents an extension of this commitment. It underscores the critical role that environmental inequities play in producing not only singular epidemics but also epidemic clusters.

For more information on the SDOH associated with substance misuse, see the SPTAC product *Incorporating the Social Determinants of Health into Substance Use Prevention*.

[1] Research on syndemics is a new field, and only a few syndemics have been positively identified so far. It has not been confirmed yet if there is a type 2 diabetes and substance misuse syndemic. However, research has shown that all the elements exist so that it could be a syndemic, as in our hypothetical community.

however, is associated with increased risk of substance misuse among Hispanic communities in the United States, but there is no scientific consensus on whether this stress influences diabetic risk.[v]

Returning to *Los Rios*, our community *does* meet the three criteria of a syndemic.

1. **Epidemic concentration.** Both type 2 diabetes and substance misuse are present in the community in epidemic proportions.
2. **Environmental influence.** Both epidemics are exacerbated by environmental inequities in the SDOH. Specifically, community members in *Los Rios* have less access to health care when compared to other communities. This reduced access stems from a local shortage of trained Spanish-speaking primary care providers; insufficient public transportation options for reaching more distant providers; and a lack of health insurance, among others. The result is that many community members do not obtain regular health care services, including regular screening for pre-diabetes or substance misuse.
3. **Epidemic interaction.** Both epidemics worsen the other. Substance misuse can decrease insulin production,[vi] potentially hastening the onset of type 2 diabetes. Type 2 diabetes can hinder the body's ability to heal from wounds,[vii] and wound development is a common comorbidity of substance misuse.[viii] Additionally, unrelated diabetic wounds can be painful, and pain coping can be a common motivator for substance misuse.[ix]

The most important reason for public health providers to care about syndemics—rather than focusing solely on their component epidemics—is this third definition criteria: epidemic interaction. Syndemics can worsen the scope, impact, or health consequences of its component epidemics.[x, xi]

These effects can be seen in *Los Rios*:

- **Scope**: Having type 2 diabetes can increase the risk of engaging in substance misuse by increasing the likelihood of self-medication for related depression or physical pain.[xii]
- **Impact**: Having type 2 diabetes can hinder one's ability to heal from wounds, which is a common comorbidity with substance misuse.[xiii]
- **Consequences**: Having type 2 diabetes and an opioid use disorder increases risk of death from all causes compared to having only one condition or neither condition.[xiv]

If providers work only within their specific service delivery silos, they may miss important opportunities to advance their community health goals.

SYNDEMICS INVOLVING SUBSTANCE MISUSE

Syndemics are identified through research, which is an ongoing process. To date, research has identified several different syndemics, ranging from HIV and tuberculosis[xv] to obesity, undernutrition, and climate change.[xvi] The field of syndemics research will continue to grow as new research emerges. But because the evidence base is still evolving, it may be difficult for providers to confirm whether a syndemic is occurring in their community.

Following are two examples of currently recognized syndemics that involve substance misuse.

Substance Abuse, Violence, and HIV/AIDS (SAVA)[xvii]

- **Epidemic concentration.** Experiencing violence is associated with a higher likelihood of engaging in risky behaviors, such as unsafe sex or substance misuse.[xviii] These behaviors can lead to negative physical and behavioral health outcomes, such as contracting HIV/AIDS or developing a substance use disorder (SUD). Both substance misuse[xix] and past experiences of violence[xx] are higher among people living with HIV compared to the general population.
- **Environmental influence.** The SAVA syndemic occurs most often among low-income urban women,[xxi] partly due to the close link in environmental inequities across the lines of race, class, and gender.[xxii] Violence and victimization are perpetuated against urban poor women of color at disproportionately high rates.[xxiii] Women of color make up the largest proportion of women living with HIV, and intimate partner violence is a significant barrier to receiving care for women at risk for HIV.[xxiv]
- **Epidemic interaction.** Substance misuse can put people in situations where they may become susceptible to violence. It may also be a catalyst for engaging in aggressive or violent behavior toward others—resulting in a cyclical relationship.[xxv] In addition, substance misuse can limit one's ability to adhere to antiretroviral therapy and quicken the progression of HIV.[xxvi] Meanwhile, HIV/AIDS diagnoses can increase risk of substance misuse and may be associated with reduced use of SUD treatment services.[xxvii]

Opioid Misuse, Overdose, Viral Hepatitis C, and HIV

- **Epidemic concentration.** The opioid epidemic has been a significant driver in the increase of the number of people who inject drugs. Sharing injection equipment

(e.g., needles or syringes) is an established cause of the transmission of blood-borne viruses such as HIV and the hepatitis C virus (HCV).[xxviii] Because of this, these conditions co-occur at very high rates—62% to 80% of people living with HIV who inject drugs are also positive for HCV.[xxix]

- **Environmental influence.** People experiencing homelessness or housing instability, who are involved with the justice system, or who have limited access to health care are at the greatest risk for opioid misuse and overdose, HCV, and HIV.[xxx, xxxi] Environmental indicators of county-level vulnerability (e.g., low per capita income, high rate of unemployment) have been found to predict rises in opioid deaths, opioid-related emergency department visits, and HIV/HCV outbreaks.[xxxii]

- **Epidemic interaction.** HIV/HCV infection and overdose are two common causes of death among people who inject drugs.[xxxiii] HIV causes dysregulation of one's immune system, which significantly limits the body's ability to fight HCV and can worsen the condition.[xxxiv] Both HCV/HIV coinfection and opioid misuse can increase the progression of other physical health conditions, such as liver disease, which represents a significant portion of deaths among people with HIV.[xxxv, xxxvi]

IMPLICATIONS FOR PREVENTION

The goal of substance misuse prevention is to identify and address the root causes of substance misuse. In fact, funding is often tied to this goal. Because of this, prevention professionals may be concerned that taking a broader view of health and wellness—as is required by syndemics—might mean losing sight of their more circumscribed substance misuse goals.

There are many opportunities, however, for prevention professionals to address syndemics while remaining true to their core mission.

One helpful approach is to think of substance misuse as one piece of a larger syndemic "puzzle." Prevention professionals do not necessarily need to work on *all* of the puzzle pieces— other public health providers can work on some of the pieces as well. But by working on their specific piece—substance misuse—and understanding how it interacts with the other pieces, prevention professionals can develop a more nuanced understanding of the needs of the people they serve.

For example, prevention professionals may learn about barriers to care that they may not have been aware of (e.g., that someone preoccupied with their HIV diagnosis might be less attentive to a substance misuse prevention message). Also, by collaborating with other "puzzle solvers,"

prevention professionals may discover ways to improve their service delivery (e.g., by developing referral partnerships). Lastly, by acknowledging the importance of syndemics and seeking to learn whether one is present in their communities, prevention professionals may discover new populations of focus for existing services.

Therefore, the key to a syndemic-informed prevention approach is to embrace the puzzle paradigm and recognize that many other sectors and providers are also working on the same puzzle.

Consider again *Los Rios*. For substance misuse prevention professionals serving this community, a syndemic-informed approach might involve working with diabetes prevention initiatives to address areas of shared interest, such as improving access to screenings. It might include implementing diabetes prevention services, since type 2 diabetes can itself be a risk factor for substance misuse. Or, at a more basic level, it might mean ensuring that existing substance misuse prevention services are available to people living with or at-risk for type 2 diabetes.

Addressing syndemics begins by understanding the root causes of each component epidemic—especially the SDOH—and how these causes interact. This includes understanding the causes of non-substance misuse-specific epidemics and, building from that, the goals of other public health sectors. Substance misuse prevention services can help to advance these goals directly or indirectly, and other sectors can help advance prevention goals in return.

To achieve these mutual goals, syndemic-informed prevention approaches should be value-added, coordinated, directly relevant to the syndemic, and collaborative.

- **Value-added.** Prevention approaches should not duplicate other existing services. For example, if a local health care system (e.g., hospital-owned primary care practices) already runs a robust screening process, there's probably no need for the prevention sector to create another screening tool. Instead, it may be more useful to launch a community education initiative about how the syndemic's component epidemics interact (assuming that such an initiative is not already in place).
- **Coordinated.** Prevention approaches should reinforce existing services. For example, messaging for a new community education initiative should align with existing evidence-based public health messaging (e.g., focus on similar risk factors). Ideally, new programming should be co-developed and implemented with other service delivery providers.

- **Directly relevant to the syndemic.** For example, a community education initiative should focus exclusively on the syndemic itself, rather than trying to link it to other community issues (unless there is evidence showing that the linkage already exists).
- **Collaborative.** A syndemic-informed approach requires collaboration with other public health sectors. This collaboration can take many forms, ranging in intensity from occasional coordination to full integration of services.

Research on effective approaches for addressing syndemics is currently limited. Yet even in the absence of such research, prevention professionals can take steps to identify syndemics in their communities and begin to approach this work through the puzzle paradigm. Doing so will, in all likelihood, lead to the discovery of new opportunities to expand or improve current services and promote positive health outcomes.

CONCLUSION

Syndemic is a new term but not a new idea. We have long known that epidemics can co-occur with compounding consequences. But by using the term, we underscore the importance of these co-occurrences and the need to address them as one. This, in turn, paves the way to creating a syndemic-informed approach to prevention—one that requires prevention professionals to consider the larger context in which substance misuse occurs, address the SDOH that affect that context, and collaborate with other public health sectors to do so. By understanding how substance misuse fits into the bigger picture of health, prevention professionals can take new or additional steps to improve the effectiveness and reach of their services.

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This tool was created by the Strategic Prevention Technical Assistance Center (SPTAC), a contract of the U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Prevention, under Contract No. 75S20322D00008/75S20322F42001(Ref. No. 283-22-0801).SPTAC is a national training and technical assistance system dedicated to advancing the application of culturally responsive, evidence-informed substance misuse prevention programs guided by SAMHSA's Strategic Prevention Framework.

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