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# Posttraumatic Stress Disorder: Five Vicious Cycles That Inhibit Effective Treatment

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## ABSTRACT

Despite a wide range of studies and medical progress, it seems that we are far from significantly mitigating the problem of posttraumatic stress disorder (PTSD). The problem has major social and behavioral components. Developing innovative and effective policies requires a broad scope of analysis and consideration of the highly interconnected social, behavioral, and medical variables. In this article, we take a systems approach and offer an illustrative causal loop diagram which includes individual and social dynamics. Based on the map, we discuss 5 major barriers for effective interventions in PTSD. These barriers work as vicious cycles in the system, reduce effectiveness and therefore value of PTSD treatment. We also discuss policy implications of this perspective.

Posttraumatic stress disorder (PTSD) is one of our major public health challenges. More than 2% of the US population (about 7.7 million people) are known to suffer from PTSD, and 7% to 8% report experiencing it at some point during their lifetime. Approximately 11% to 20% of veterans of the Iraq and Afghanistan wars have been coping with PTSD. These veterans are 4 times more likely to abuse alcohol and 6 times more likely to develop a marijuana dependence.<sup>1,3</sup> In addition to the patients, many others are indirectly affected by PTSD, including family members, friends and community members, colleagues, and employers. Their reactions toward PTSD patients (support vs exclusion) influence patients' care-seeking behavior and treatment progress. Despite a wide range of studies and medical progress, it seems that we are far from significantly mitigating the problem.

Major social and behavioral issues are involved with PTSD. Data show that about 50% to 75% of people with psychiatric disorders do not receive mental health services and, of those who do, 50% to 60% drop out from treatments.<sup>3-5</sup> The authors believe that developing innovative policies to address PTSD requires a broad scope of analysis and consideration of the highly interconnected social, behavioral, and medical variables. This process requires a systems approach. Drawing upon the system dynamics methodology, we offer an illustrative causal loop diagram that demonstrates 5 major barriers for effective intervention in PTSD. The model reflects shared knowledge of an interdisciplinary research team and is a step forward for using a systems approach to study PTSD.

## SYSTEMS SCIENCE

System dynamics is a common method among systems scientists primarily used to analyze behavior of complex social systems.<sup>6,7</sup> Feedback loops are at the heart of the

method to help demonstrate circular causality in a system (eg,  $X$  causes  $Y$  and  $Y$  causes  $X$ ). Feedback loops are considered "reinforcing" when an increase in a variable reinforces its future increase, and "balancing" when an increase in a variable results in a future decline in the same variable. Feedback loops can be major sources of continuous growth and improvement (virtuous cycles) or exponential collapses (vicious cycles). A few recent applications of system dynamics in public health are in the studies of dental health,<sup>8</sup> obesity,<sup>9,10</sup> cardiovascular diseases,<sup>11</sup> and obstetrics.<sup>12</sup>

System dynamics provides a platform to develop causal maps and help productive discussion across different stakeholders.<sup>13,14</sup> These maps are effective tools for problem conceptualization.<sup>15</sup> Here we follow a similar goal by developing a simple but hopefully useful model of PTSD for making sense of complexities of the problem. We intend to offer first order insights by uncovering 5 major challenges for PTSD treatment.

## CAUSAL DYNAMICS

Our focus, PTSD treatment, is a complex process and depends on a wide range of factors. We categorize the factors as medical, social, and personal, as shown in Figure 1. Medical factors represent the quality of services provided by the healthcare system. Performance of the healthcare system, medical advancements, and timely response to needs can help patients' treatment. Social factors include how families, relatives, friends, and society in general influence PTSD treatment. Supports of a social nature are central in accelerating treatment. Personal factors include patients' willingness to receive care and their compliance with treatments. Patients should first decide for themselves that they want treatment; otherwise medical expertise and social supports

are less likely to help. In order to increase the treatment rate, we should take actions that improve all three, a complex task.

We take a further step in Figure 2, depicting how the 3 factors are influenced in a multilayer map of the system (individual, family/friend, and societal layers). The blue boxes present different layers of the model. At the Individual layer, the smallest box in Figure 2, patients are influenced by individual level dynamics which include medical factors and one's willingness to seek care. The Family/friend layer includes dynamics that are imposed by how one's close circle of people behave regarding the illness. At the Societal layer, the behavior of the society at large regarding PTSD patients is depicted, which, in turn, eventually has an effect on the Individual layer.

As shown in the form of balancing loops B1, B2, and B3, there are "potentially" self-correcting mechanisms that can help PTSD treatment. In the absence of social and psychological barriers, a patient is expected to seek care once he or she knows about the illness (loop B1), which reduces the PTSD extent, and reduces PTSD symptoms. Furthermore, people in close proximity to patients with whom they have regular contact, such as family members and friends (hereafter, "close circle"), can play an important role in patients' treatment. They can directly help PTSD treatment (loop B2) and encourage PTSD patients to seek care (loop B3), thus increasing the chances of early diagnosis and treatment.<sup>16</sup> However, there are significant barriers that work against these self-correcting mechanisms. We review 5 major ones.

#### FIVE MAJOR VICIOUS CYCLES

##### R1: Cascading Illness and Medical Complexity

A number of effective treatment procedures have been developed and successfully tested.<sup>17</sup> The problem is that if patients avoid actively seeking care, the illness progresses (PTSD extent goes up), and their medical condition worsens. As the disease progresses, and as other mental and physical illnesses co-occur, complications increase nonlinearly and make medical interventions complex and progressively less effective. Data indicate that about 8% of patients with PTSD develop co-occurring psychiatric disorders.<sup>18</sup> The link between cardiovascular diseases (including heart failure) and PTSD has been consistently found in different studies.<sup>19,20</sup> Patients' self-treatment in the form of alcohol or drug abuse contributes to complications. Other evidence suggests high likelihood of developing other mental disorders

for PTSD patients.<sup>21</sup> These patterns result in a reinforcing loop (R1), which pushes mild medical illnesses to chronic and chronic to life-threatening conditions. Such a comorbidity is so regularly observed that it is referred to as a "rule."<sup>22</sup>

##### R2: Cascading Illness and Exclusion from Family and Friends

Supportive behavior is not always guaranteed. While close circles can support and help treatment, their tolerance is limited. As illness progresses with more and more PTSD-related symptoms and incidents, family and friends are increasingly likely to drop out from supporting the patient (loop R2a) and to start keeping their distance from the patient, further exacerbating the situation (loop R2b).<sup>21</sup> Lack of social support contributes to PTSD extent,<sup>16</sup> where one problem leads to another, resulting in bigger social and medical problems, cascading illness, and related complications. Examples include family problems and breakups, unemployment, homelessness, and suicidal ideation.<sup>21</sup> This potential cascade stresses the importance of early treatment before it becomes too late and before family members' and friends' coping capacities have deteriorated.

##### R3: Stigma and Social Exclusion

Stigma has been cited as the main social barrier to receiving care.<sup>3,17,23,24</sup> Patients revealing their mental illnesses publicly may suffer a wide range of consequences such as a higher likelihood of losing jobs or discrimination in workplaces, lower income, difficulties in finding housing, and exclusions from social communities.<sup>25</sup> Social exclusion is identified as one of the factors that evoke psychological mechanisms (such as fear) that contribute to worsening PTSD.<sup>26</sup> Consequently, a reinforcing loop emerges where PTSD treatment affected by stigma and society at large is incapable of supporting the patients. In Figure 2, Loop R3 depicts how stigma and social exclusion have a first-order effect on treatment. As the number of PTSD-related incidents increases, affecting public perception of patient risk, people increasingly keep their distance from PTSD patients or even discriminate against them in workplaces. Such social exclusion affects the PTSD treatment rate and contributes to an accumulation of untreated PTSD patients.

##### R4: Stigma, Fear of Exclusion, and Self-fulfilling Prophecy

One important causal mechanism depicted in Figure 2 as loop R4 is the relation between fear of social exclusion

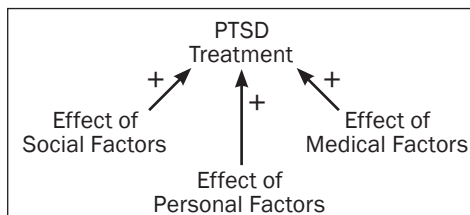


Figure 1. A simple representation of factors which influence PTSD treatment. Note: Plus (positive) signs indicate that the variables move in the same direction.

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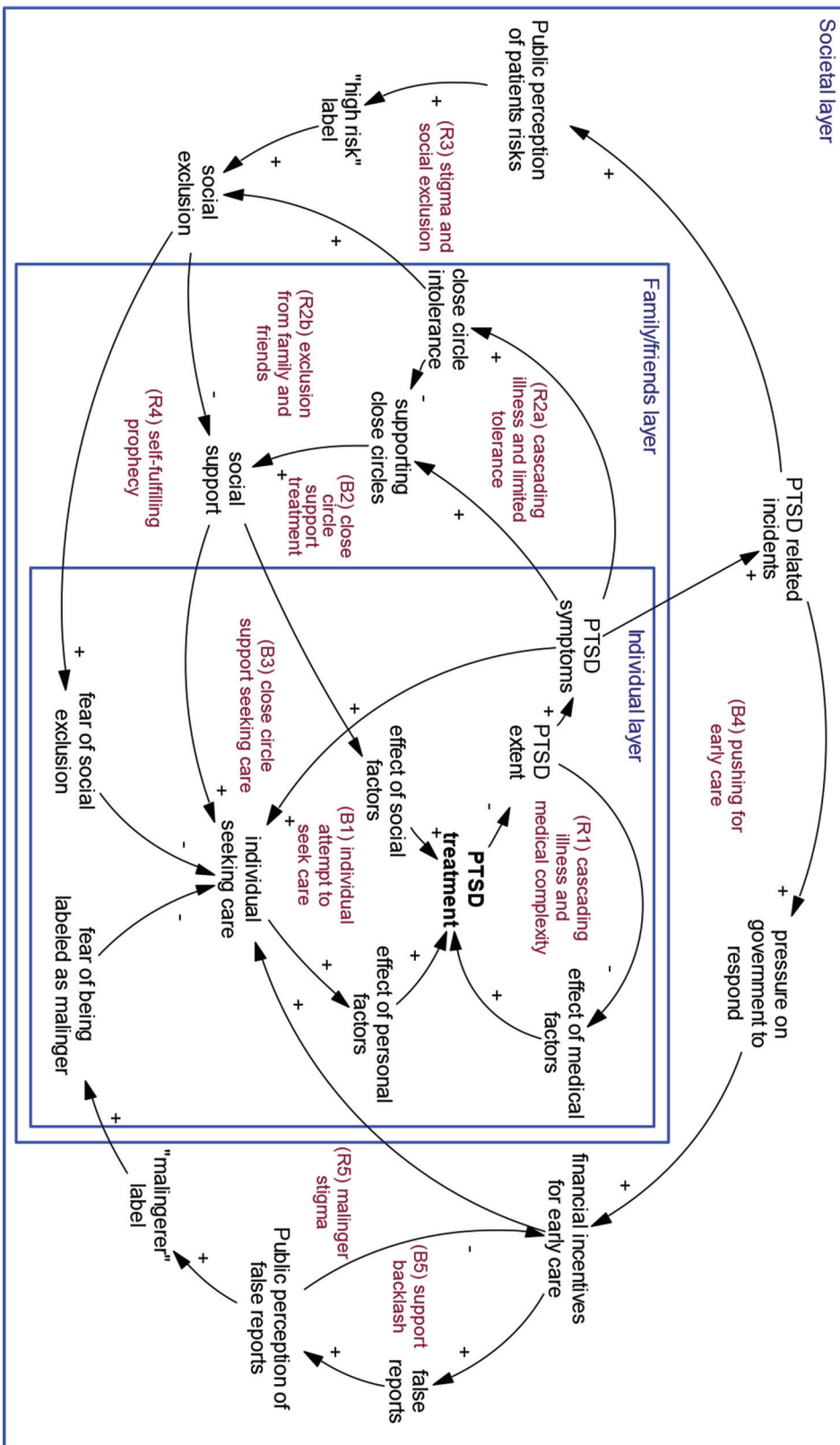


Figure 2. Multilayer dynamics affecting PTSD treatment. The multilayer dynamics are represented as individual, family/friend, and societal layers. At the individual layer, one's own health and actions are influencing treatment. At the second layer, family/friends have effects on treatment. At the societal layer, many patients' behaviors are observed and create public perceptions and the associated labels, which ultimately affect individual layer dynamics. Note: Plus (positive) signs indicate the variables move in the same direction. Minus (negative) signs mean variables move in the opposite direction.

and social exclusion. As new patients see that people with PTSD are labeled, excluded from various opportunities in the society, and lose their family members' support, they become unwilling to accept and announce their illness and seek treatment. Fear of social exclusion decreases individuals' willingness to seek care, which results in progression of illness and symptoms.<sup>17</sup> If the majority of patients think being labeled with PTSD has considerable negative consequences, they will hide their illness, which will exacerbate it and will actually result in considerable negative consequences once symptoms become difficult to hide. This phenomenon creates a reinforcing mechanism that is likely to work as a vicious cycle making it very difficult to break PTSD stigma. The psychology literature refers to this type of mechanism as a self-fulfilling prophecy: one's fear of possible exclusion and discrimination results in exclusion and discrimination.

This pattern is not limited to patients, but a similar self-fulfilling phenomenon can emerge when the public's expectation of risks of PTSD contributes to risks of PTSD. If, assuming that there are high risks associated with social engagement with PTSD patients, the majority of people limit their contacts with PTSD patients, those patients' well-being can suffer, illness progress can accelerate, and PTSD related incidents can increase. Thus, perception of risks of engagement with PTSD patients contributes to an increase in risks of engagement with PTSD patients.

#### R5: Incentives, Backlash, and the "Malingering Stigma"

A seemingly smart policy is to increase early diagnosis and care of PTSD patients. But we do not know exactly how to do this. In the military, policymakers have offered financial incentives and early discharge policies to encourage patients to seek early care (loop B4). However, a considerable number of false reports have emerged.<sup>29</sup> Once identified, personnel who falsely claim PTSD are known as malingers.<sup>27,28</sup> In the past 13 years, financial supports for PTSD patients have grown by about 400%.<sup>30</sup> Anecdotal evidence suggests that exaggeration or fabrication of symptoms might be as high as half of the population of patients.<sup>30</sup> Whether those anecdotes are right or wrong, they depict an emerging perception of some PTSD patients being malingers. In military culture, malingering is an unacceptable behavior. Since false reports and malingering are eventually noticed, financial incentives lose their legitimacy (B5).

In addition, false positives have resulted in a major negative effect on willingness to seek care by those actually needing care. This is due to the emerging label of "malingers" and its associated stigma. In the military

context, many people might initially join the military with a high level of pride. They might prefer to "tough it out" with problems rather than being labeled as weak or lazy or manipulative. Society, friends, and family members have high expectations. However, as people notice that some are using PTSD as an excuse to take advantage of the system, fear of being labeled as a malingering discourages real patients from seeking care (loop R5). Thus, providing incentives not only falls short in resolving the high risk label and associated stigma, but also creates the malingering label and its associated stigma.

#### TOWARD INNOVATION

While the map illustrates several challenges for PTSD treatment, it is still a highly simplified representation of the problem. The goal was to offer an example of a systems approach to the problem of PTSD and discuss 5 major barriers for PTSD treatment that work as vicious cycles at individual, family/friends, and societal layers.

What can be done? There are a few examples of structural changes that have been offered to overcome the problem of PTSD, such as addressing public stigma through providing better knowledge of PTSD, educating families, and addressing cultural barriers.<sup>17</sup> Several other studies of PTSD offer incremental steps for improvement. As we discussed, various sources of resistance to PTSD treatment exist which create numerous vicious cycles, making seemingly "smart" policies, such as providing financial incentives for early treatment, ineffective.

Overcoming the vicious cycles of public perception and fear of social exclusion requires positive and constructive approaches to the problems of PTSD. Public perceptions of PTSD patients are formed by seeing or hearing news about these patients. Rarely does the public hear news about riskless patients. Rather, media news focuses on individual extreme cases. As a result, low risk patients are equated with high risk patients through the PTSD label. To remove the label from patients, one solution is to offer a continuous measure of "PTSDness." The idea is that everyone in the target population (such as all military personnel) would receive a number in a continuous range—not a binary label. Such a number could, for instance, be on the scale of 1 to 99, the assigned number dependent on level of symptoms. In this approach, everyone has a positive PTSD score, rather than a binary yes or no PTSD label. Also, nobody is 100% free of PTSD (there are no zeros) and nobody is 100% PTSD (there are no 100s). The number represents the level of care that a specific patient needs. While this might be contrary to our intuition that people cognitively like simple categorizations and labels, the benefits can be considerable and can help overcome the labeling issues. Once people see



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that the population of patients is dominated by low risk individuals, their judgment can more easily change and the label can lose its association with high risk patients.

The proposed model considers PTSD treatment at the center of attention with feedback loops that are beyond any single organization's boundary. This is another indicator that PTSD is a multiorganizational challenge. In simple words, no single organization is responsible for the described feedback loops. The loops are due to actions and reactions of multiple entities such as patients, patients' family members, employers, colleagues, community, neighborhood, and larger entities such as media, the military, veterans' affairs, and elected government officials. These stakeholders have different incentives and sets of interests: the military focuses on effects of PTSD on servicepersons' military readiness, the health-care system focuses on healthcare coverage, Congress is concerned with costs, and the VA focuses on health outcomes. While all these variables are interconnected, at any given time a service member or veteran may be under the jurisdiction of a single-organization whose "systems view" is a narrow subset of the larger system we have discussed. Placing internal boundaries within the larger system and "optimizing" for the subsystem may in fact lead to negative consequences that few would support. There is no easy way to overcome the problem of stakeholder misalignments. However, systems models have been successfully used in other contexts to help different stakeholders communicate and understand the whole system.<sup>13</sup> Systems maps, such as the one represented by Figure 2 in this article, are used as boundary objects for effective communications across organizations with differing goals and world views.<sup>13,14</sup> We think an effective systems approach should consider a large boundary for the problem of PTSD, one that includes multilayer dynamics, connects all relevant variables, clarifies how different stakeholders react to changes, and elaborates on the links to the most important variable of interest: public health.

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