

# Health as a Planning Problem

## Combatting Diseases of Poverty

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### ABSTRACT

Diseases of Poverty (DOP), a group of parasitic and bacterial diseases characterized by their high prevalence and debilitating effects on poor communities, affect almost 12 million Americans per year. With over 20 variations, including hookworm and Chagas, DOP can have profoundly detrimental impacts on the individuals and communities affected. We can understand the issue of DOP within the United States as a result of two main factors: the lack of private and public knowledge of DOP and failing infrastructures across the South. Because many determinants of DOP are outside the direct control of the health sector and are laden with social, economic, and environmental influences, an effective policy solution should focus on improving disease-promoting environments and the failing water and waste infrastructure systems in which at-risk individuals live. Policies focused on water and waste infrastructure can play a proactive role in preventing the spread of DOP through ensuring safer and cleaner living spaces, aiding in the prevention – not just treatment – of DOP. More specifically, a multi-level infrastructure policy that targets funds and resources to rural, low-income communities through cooperation between all levels of government is essential to address DOP. I propose a DOP infrastructure program specifically for rural, low-income communities in which the federal government provides block grants to state governments and sets guidelines for spending while localities are responsible for the collection, use, and application of state-appropriated funds.

Diseases of Poverty (DOP) are commonly thought to be a problem of the U.S.'s past, or of the Global South. However, DOP affect around 12 million Americans per year.<sup>1</sup> DOP are chronic and debilitating parasitic and bacterial diseases that thrive in unsanitary living environments.<sup>2</sup> The failing water and sewage infrastructures in rural and impoverished communities across the United States leave many people vulnerable to the risks of DOP. These diseases, such as hookworm and Chagas, have a disproportionate effect on those in extreme poverty and can have chronic and disabling impacts, including death.<sup>3</sup> Those affected are generally concentrated in extremely impoverished geographical pockets with large minority populations in the Southwest and South, such as the Mississippi Delta and southern Texas.<sup>4</sup> Often, the victims are overlooked because of the lack of awareness and understanding of these diseases. Altogether, there are more than 20 DOP that drive a cycle of crippling poverty in conjunction with social, economic, and environmental factors.<sup>5</sup> In this piece, I examine the persistence of DOP in the U.S. and offer policy solutions to combat DOP from an urban planning perspective.

## THE RISE AND FALL... AND RISE AGAIN OF DISEASES OF POVERTY IN THE UNITED STATES

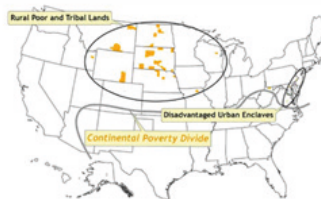
Most DOP were thought to be eradicated in the late 20<sup>th</sup> century due to tremendous strides in public health. However, many of these diseases have reemerged in the past several decades because of widening wealth gaps and the unaddressed failing infrastructures across the U.S. For example, although hookworm was thought to have been eradicated in the 1980s, recent studies of rural Alabama show that the parasite survives at a breathtaking scale.<sup>6</sup> The immediate symptoms of hookworm

infestation include iron deficiency, weight loss, and tiredness; greatly slowed cognitive development and stunted growth are some of the more serious long-term effects.<sup>7</sup> This case is not unique; many DOP have similar effects on mental and physical development which add to the barriers that prevent people from escaping deep poverty.

A lack of knowledge, research, and medical intervention only exacerbates DOP and contributes to the interdependent relationship of infectious and parasitic diseases with poverty.<sup>8</sup> In recent decades there has been a shift from a focus on infectious diseases to a focus on chronic health challenges, such as obesity and diabetes.<sup>9</sup> This leaves DOP widely unaddressed. It is likely that many impoverished Southerners have



Tribal Lands	Border Region	Mississippi Delta Cotton Belt	Appalachia
Echinococcosis	Brucellosis Cysticercosis Chagas Disease Dengue Leishmaniasis Leprosy	Ascariasis Chagas disease Congenital CMV Congenital toxoplasmosis Toxocariasis Trichomoniasis	Ascariasis Strongyloidiasis



Rural Poor and Tribal Lands	Disadvantaged Urban Enclaves
Echinococcosis Toxoplasmosis Trichinellosis	Congenital CMV infection Congenital syphilis Congenital toxoplasmosis Leptospirosis Toxocariasis Trench fever Trichomoniasis

Figure 1. Location of counties with the highest poverty rates in the U.S. – at least 2 standard deviations above the mean – and the associated DOP (Peter J. Hotez, *Public Library of Science Neglected Tropical Diseases*, 2008).

suffered from DOP for decades with little acknowledgement, research, or medical diagnoses.<sup>10</sup> Even non-profit and philanthropic organizations have overlooked DOP in the U.S., funding projects and research and development (R&D) in the Global South, but providing virtually no support for domestic DOP eradication.<sup>11</sup> The organization Families USA reported that in 2007 the National Institute of Health's funding for DOP comprised less than 1 percent of its total research budget.<sup>12</sup> In addition, the current scale of the problem cannot be fully articulated due to a lack of in-depth research and knowledge regarding DOP prevalence within the U.S.<sup>13</sup>

The U.S. medical field has a blind spot when it comes to DOP, resulting in a lack of timely diagnostic testing and a dearth of interventions.<sup>14</sup> The Centers for Disease Control and Prevention (CDC) suggests that a "majority of physicians are not even trained to recognize or diagnose neglected tropical diseases affecting poor Americans, much less manage or treat their illness."<sup>15</sup> This is supported by a 2010 CDC survey on physician knowledge surrounding Chagas. The study revealed that almost half of U.S. primary care physicians and a third of cardiologists never considered the disease when treating patients, and approximately half of them weren't aware of the disease's symptoms.<sup>16</sup> Over 20 varieties of DOP can also often masquerade as more common diseases such as the flu. This lack of medical diagnoses leaves these diseases untreated for years, completely debilitating those infected.<sup>17</sup>

Combatting DOP is not just a public health concern, but a matter of taking care of U.S. communities who have no viable way to address DOP themselves. Those most vulnerable to DOP are often those living in situations of extreme poverty. Poverty impacts living conditions and can favor the spread of – and exposure to – DOP through inadequate housing conditions and poor infrastructure.<sup>18</sup> Further, researchers worry

that the effects of DOP related to failing and inadequate infrastructure will only be exacerbated as temperatures rise due to climate change. Warmer temperatures allow for continued breeding of DOP during winter months, exposing vulnerable populations to a longer window for contracting DOP.<sup>19</sup>

Because those in extreme poverty have very few resources and limited access to health care, it has been nearly impossible to even begin to address sanitation conditions or treatment of infections.<sup>20</sup> Addressing DOP is vital to protecting the nation's health and addressing a neglected population's struggles in accessing necessary care. Dealing with DOP in impoverished communities would signal an attempt to reduce social disparities of health in the U.S.

## **SOLVING THE CHALLENGES TO ADDRESS DISEASES OF POVERTY**

To successfully address DOP within the U.S., we must first understand the issue as a result of two main factors: the lack of private and public knowledge of DOP and failing infrastructures across the South. It is important to both heighten awareness about DOP and increase available funding streams for communities experiencing high levels of DOP to properly address failing and non-existent water and waste management infrastructure. A comprehensive analysis that includes these factors is crucial in determining a successful DOP-reduction policy.

## **PROPOSED INTERVENTIONS TO ADDRESS DISEASES OF POVERTY**

While R&D has been an effective tool used to curb the spread of various diseases, it addresses only part of the problem. DOP

are unique in that they affect only those in extreme poverty, making investment in DOP R&D unappealing to private investors and research organizations.<sup>21</sup> Health education campaigns have also historically been used to bring widespread awareness to important health issues. However, people affected by DOP often live in rural and impoverished areas and are less connected to the internet and other outlets, so public service announcements and information campaigns are not easily accessible.<sup>22, 23, 24</sup>

Lastly, while increased training of medical professionals about DOP can be helpful with diagnosis and treatment, many of those affected by DOP do not engage with the formal health care system, as they often do not have health insurance or access to health clinics.<sup>25</sup> The bottom line is that many determinants of DOP lay outside the direct control of the health sector and are laden with social, economic, and environmental influences. Therefore, to reduce both the contraction and health implications of DOP, the most effective and efficient solution is through targeting water and waste infrastructure policy.

One of the most striking reasons DOP

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disproportionately affect those in deep poverty is the effects of disinvestment and limited resources on inadequate living conditions, including water and sewage infrastructure. Those in extreme poverty are more likely to live in environments that leave them vulnerable to unsanitary conditions, unsanitary animals, contact with sewage, and inadequate temperature control. These living conditions create habitats where infectious and parasitic diseases can thrive, exposing people to possible infection.<sup>26</sup>

In the past several years, the National School of Tropical Medicine at Baylor College of Medicine partnered with the Alabama Center for Rural Enterprise to research the relationship between a lack of infrastructure and exposure to hookworm in Lowndes County, Alabama. Over a third of Lowndes County residents are impoverished, the majority are African American, and many are exposed to unsanitary sewage and water conditions.<sup>27</sup> Because an estimated 80 percent of Lowndes County is not covered by any municipal sewage system, many homes are forced to connect their toilets and sinks to straight pipes that dump waste in nearby creeks or backyard pits.<sup>28, 29</sup> Baylor and the Alabama Center for Rural Enterprise found that two out of five people had hookworm as a result of weakened or non-existent infrastructure that nurtured breeding conditions.<sup>30</sup>



*Figure 2. A home with a failing septic system in Lowndes County, Alabama (Anna Leah, Huffington Post, 2018).*

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An effective infrastructure policy should focus on improving the disease-promoting environments and failing water and waste infrastructures in which at-risk individuals live. More specifically, a multi-level infrastructure policy solution focused on primary prevention in rural, low-income communities is best suited to directly address the source of DOP's prevalence in the U.S. Fixing infrastructure in high-risk areas can improve the lives of whole communities and pave the way to fixing dilapidated infrastructure across the U.S. Infrastructure policy solutions must be tailored to directly address environments in which DOP thrive. According to the Environmental Protection Agency (EPA), around 20 percent of U.S. households use onsite septic systems. In Alabama, over 800,000 private septic systems are not hooked up to municipal piping; 200,000 (25 percent) of those systems are failing.<sup>31</sup> Such infrastructure failures are not confined to Alabama; they plague rural communities across the country.

## **INSUFFICIENT FUNDS AT LOCAL LEVELS**

Current policies that attempt to address DOP and failing water and waste management systems are severely underfunded, are disjointed, or lack the specificity and focus needed to repair the infrastructure of impoverished rural communities facing DOP. Throughout

the country, there are thousands of communities with failing infrastructure that need assistance but have no avenues to fund expensive infrastructure projects. For example, in Lowndes County, Alabama, the median household income in 2018 fell below \$28,000, while a single septic tank system can cost up to \$10,000.<sup>32</sup> With over 200,000 failing septic systems in Alabama alone, to fix each individual tank across the country would cost over \$4 billion – almost eight percent of the entire federal budget.<sup>33</sup> Small water infrastructure systems with fewer users often experience higher charges and fees, leading to reduced compliance and poor management in communities that cannot afford these higher prices. The EPA estimated that as of 2012, rural communities needed \$68 billion in funding for systems to meet water quality standards. Of that, small communities with populations of under 10,000 made up around \$33 billion of funding needs – primarily for improved wastewater treatment and sewer overflows.<sup>34</sup> It is clear that small rural communities and states cannot handle these infrastructure issues alone; there must be large-scale federal assistance to better address environments where DOP thrive.

Currently, the EPA and Department of Agriculture (USDA) oversee various federal programs designed to tackle failing water and waste management systems. However, the EPA and USDA programs are deeply under-resourced and underfunded. The EPA's funding for the programs that assist rural localities is now 40 percent below the 2001 level. This allocated funding is far below the projected investment needs, estimated to be around \$600 billion.<sup>35</sup> In addition, at the end of 2007, the "USDA reported a \$2.4 billion backlog of requests for 928 water and wastewater projects for its grant and loan programs."<sup>36</sup>

While there are well-funded programs that may help reduce the environments DOP need to thrive, such as the Clean Water

Act (CWA), they are not uniquely tailored to rural infrastructure needs. The CWA provides funds for both rural and non-rural communities, forcing all localities to compete for funds. This competitive situation, paired with persistently low levels of funding, leaves many small, impoverished communities at a disadvantage.<sup>37</sup> The U.S. Department of Housing and Urban Development (HUD) administers the Community Development Block Grant (CDBG) program, which provides funds for a broad range of housing needs including water and waste disposal projects. Because of this, water and waste disposal funding compete with other housing needs. Thus, the CDBG puts only 10 to 20 percent of its funds towards water and waste management infrastructure.<sup>38</sup> Further, only 30 percent of CDBG funds are available for rural localities.

The 2018 reauthorization of the Farm Bill included the Rural Septic Tank Act in the House of Representatives and the Consolidated Farm and Rural Development Act in the Senate.<sup>39</sup> This legislation aims to expand USDA's grant program to provide grants of up to \$15,000 to nonprofits that assist rural households with installing or maintaining individually owned decentralized wastewater systems in hopes of addressing failing rural sewage systems across the South.<sup>40</sup> While this is a crucial step in managing the spread of DOP, it falls short by providing funds only to nonprofits and not directly to local governments or individuals to address wastewater infrastructure concerns.

In rural communities, locals are often the ones who know community needs best. In such isolated areas, nonprofits may not be abundant or may not be the best-suited entities to efficiently and successfully identify and address the most pressing wastewater issues. There must be more avenues through which local communities and governments can directly access funds to address DOP.

## TARGETED INFRASTRUCTURE POLICIES FOR RURAL COMMUNITIES

There remains a great need for water and waste infrastructure funding in rural communities across the country. Currently, there is no comprehensive infrastructure policy that efficiently and effectively engages all levels of government to address DOP in extremely impoverished rural communities. The existing fragmented and unspecific policies, although attempting to ease financial burdens on states and localities trying to resolve water and waste disposal problems, do not directly identify or address the particular promoters of DOP plaguing rural communities across the U.S. experiencing extreme poverty. There is a dire need for an intricate policy solution that is devoted to reducing DOP in rural U.S.

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A DOP infrastructure policy must be publicly financed. DOP thrive in situations in which individuals cannot pay for any amount of intervention. Such economic situations provide no incentives or returns for private funders or partners to meaningfully invest in local infrastructure, leaving it up to the government to bear the cost and burden of resolving the poverty-induced public health crisis.<sup>41</sup> To provide enough funds to cover a complex DOP infrastructure plan, the

federal government must raise additional revenues. Whatever the means for garnering the project funds, they should not negatively impact low-income individuals. A sincere DOP-reducing program will acknowledge the inequity driving DOP and ultimately attempt to redistribute funds to improve living environments for those in extreme poverty.

## FEDERAL, STATE, AND LOCAL COOPERATION

To address both current and future cases of DOP, I propose an infrastructure policy plan tailored to the waste and water infrastructure needs of rural, low-income communities. This policy plan would connect federal, state, and local governments through designated financing structures, oversight roles, and implementation strategies that incorporate community-centered solutions. Such a policy solution would foster the strengths of federalism through playing to each level of government's institutional scope and abilities, share responsibility, and increase participation to ensure adequate funding and implementation.

The federal government is best situated to deliver and allocate funding to ensure a comprehensive and uniform DOP policy plan across state and regional jurisdictions. Therefore, under this policy solution, the federal government would provide grants to state governments and set guidelines for spending. A majority of funding must be explicitly allocated to improve the water and waste infrastructure of communities with current cases of DOP. The rest should be distributed to infrastructure improvement projects that will reduce future risk of DOP from the impending impact of climate change and general infrastructure concerns. Grant funds provided to states should go to low-density, rural communities that have median incomes at or below the national poverty level. All funding must be

given to communities with evidence of high DOP concerns. The federal government should also oversee and enforce the distribution of funds to ensure that states are equitably and adequately addressing the infrastructure needs of communities.

States are uniquely situated as intermediaries between federal funds and the communities in need. A state's role is to dispense funds to rural communities with recorded cases of DOP that meet the aforementioned grant criteria. The other portion of funds must be reserved for preventative infrastructure projects. To ensure that the program successfully combats future cases, communities at a high risk of DOP with lower median incomes and higher minority populations must be prioritized to receive funding. States should be permitted to allocate funds to non-rural communities if there is evidence that those communities have infrastructure concerns that correlate with potential exposure to DOP. States also play a central role in collaborating with underfunded localities to create action plans to address infrastructure concerns.<sup>42</sup>

Local governments are at the front line of infrastructure improvements and should be responsible for the collection, use, and application of state-appropriated funds. Qualifying municipalities should be given some discretion on how to improve or prevent unsanitary infrastructure conditions in their communities. Discretion on infrastructure improvements allows for innovation in addressing DOP within the framework of the grant program. Additionally, because the most vulnerable populations are also often underrepresented, each qualifying locality should be required to hold public forums or meetings or conduct surveys that directly engage underrepresented populations within the community to ensure the equitable use of funds.

Managing unsanitary and desolate infrastructure requires collaboration

between all levels of government. Each community has different geographical, social, and economic barriers that intersect to determine risk of DOP contamination, making a blanket policy approach ineffective. Instead, a successful infrastructure plan requires the incorporation and collaboration of each level of government to respond to the infrastructure needs of communities across the country.<sup>43</sup>

## CONCLUSION

DOP are a hidden health risk that plagues rural communities in extreme poverty. To immediately combat the rising concern of DOP within the U.S., a policy plan that addresses failing infrastructures in impoverished rural communities must be introduced. Medical and public health

interventions are important. However, because DOP are concentrated in communities of extreme poverty, such interventions are very difficult to efficiently and effectively implement in a manner that prevents and treats DOP for those most in need. Current water and waste infrastructure policies attempt to address failing systems but lack the specificity and direct allocation of funds to rural and impoverished communities where DOP thrive. Successful policy will seek to combat current cases as well as prevent future risk of contamination that is bound to increase due to the widespread lack of infrastructure maintenance and the impending effects of climate change. It is time to put forth a solution that assists the most vulnerable populations and seeks to end the cycle of poverty promoted by crippling diseases across the U.S.

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## ABOUT THE AUTHOR

Heather Kiningham is a dual Master of Social Work and Master of Public Policy candidate at the University of Michigan. She received a Bachelor of Arts in Political Science from American University in Washington, D.C. in 2015. After graduation, Heather worked as an international trade paralegal before moving back to her hometown near Ann Arbor. She is interested in social and health policies and how macro social work can be utilized in policy interventions to reduce health inequities.



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