




Family Medicine's Role in Addressing the Intersections of Redlining and Climate Change


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Abstract

Redlining, the practice of discriminating against specific neighborhoods based on race and socioeconomic status, leads to persistent environmental hazards and socioeconomic inequalities that have lasting adverse health effects on their populations. Health disparities are further exacerbated through the concentration of environmental hazards, as well as the escalating impact of climate change, which poses an increased risk of respiratory illness, cardiovascular disease, mental health issues, heat-related illness, infectious diseases, food insecurity, and socioeconomic difficulties in redline neighborhoods.

This paper examines the interplay of redlining, climate change, and health disparities, with an emphasis on the enduring consequences for these marginalized communities. Through our research, we hope to foster a more equitable and just society for all by making an urgent call to action to dismantle the historical legacy of redlining and its health impacts, including climate change, for marginalized populations. Our research found that family medicine physicians, as well as other interdisciplinary collaborators and stakeholders, are pivotal to the development of comprehensive and equitable solutions for promoting health equity and resilience, as well as implementing strategies to mitigate these climate-related health issues through equitable healthcare access for all populations.

Keywords: *redlining, family medicine, primary care, climate change, health disparities, environmental justice, community engagement, social justice*

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Introduction

The practice of redlining in the United States originated in the 1930s when the Federal Housing Administration (FHA) and the Homeowners' Loan Corporation (HOLC) began to systematically evaluate neighborhoods for mortgage lending risk (Lynch et al., 2021). These evaluations were often racially biased, marking predominantly African American and minority neighborhoods as “high-risk” and coloring them red on maps (Lynch et al., 2021). This led to disinvestment in these areas, as banks were less likely to offer loans for homes or businesses, perpetuating poverty cycles (Mendez-Carbajo, 2021).

The legacy of redlining also led to entrenched racial disparities in wealth, educational attainment, and health outcomes that persist to this day. These disparities continue to serve as poignant examples of how systemic racism can have multifaceted, long-lasting impacts on marginalized communities. Due to disinvestment, redlining has impacted racial segregation and equity issues, creating a self-fulfilling prophecy of decline as property values stagnated or fell, schools were underfunded, and businesses moved away or never arrived (Lynch et al., 2021).

This paper examines the intersection of redlining, climate change, and health disparities. By uncovering the underlying mechanisms and outlining actionable recommendations, this research strives to contribute to the body of knowledge, as well as foster positive change for those affected by the enduring legacy of redlining and the escalating challenges posed by climate change.

Redlining

Commencing in the early 20th century, redlining entailed the deliberate refusal of financial services, such as loans and insurance, to neighborhoods based on resident racial and socioeconomic profiles (Mendez-Carbajo, 2021). Mendez-Carbajo (2021) further suggested that this discriminatory practice helped perpetuate racial segregation and exacerbated socioeconomic disparities, which led to long-term consequences for marginalized communities.

Redlined communities were often located close to city centers and still today bear the scars of past discrimination. These cities tend to exhibit stark differences from those of non-redlined areas, as their populations tend to be more segregated and have lower income levels. Consequently, individuals living in redlined neighborhoods are more susceptible to health disparities and adverse health outcomes (Lynch et al., 2021; Nardone et al., 2021). Studies reveal a striking correlation between redlining and the concentration of environmental hazards in marginalized communities (like pollution and inadequate infrastructure)—a testament to systemic neglect. Roanoke, Virginia, for example, shows a clear pattern of redline districts near what were referred to as “brownfield sites” (Kim & Miller, 2017).

Brownfield sites consisted of land previously used for industrial or commercial purposes. These sites, which may be contaminated by hazardous waste or pollution, often require remediation or environmental cleanup before being repurposed for new uses, such as residential or commercial development (Kim & Miller, 2017). The deliberate placement of undesirable facilities, such as industrial and waste disposal sites, in these

redlined areas perpetuated environmental injustice and disproportionately exposed residents to harmful toxins and pollutants (Lane et al., 2022).

Public and private investment are also disproportionately low in redlined communities, so green space is limited, or its quality is poor (Lane et al., 2022), making parks, recreational facilities, and tree cover sparse (Lane et al., 2022; Nardone et al., 2021). This lack of green space and disinvestment exacerbate environmental justice issues, as well as contribute to various health disparities like increased rates of respiratory illnesses and stress-related conditions among their residents (Lane et al., 2022).

Climate Change

The growing threat of climate change further compounds the challenges associated with redlined communities (Lane et al., 2022; Thompson-Robinson et al., 2021; Winling & Michney, 2021). Citizens in these vulnerable communities are often at an increased risk of health impacts related to climate change (Enterprise Community Partners, 2021; Li et al., 2021).

Climate change, characterized by rising temperatures, extreme weather events, rising sea levels, and altered precipitation patterns (Özdem et al., 2014), has far-reaching implications for human health, with the most vulnerable populations bearing the brunt of the consequences (Adepoju et al., 2021; Berberian et al., 2022; Haq et al., 2023). Recognizing the role of redlining in perpetuating health disparities, as well as the exacerbating effects of climate change on these disparities, is crucial for developing effective strategies to address these interconnected challenges.

Health Disparities

The intersection of redlining and climate change poses an extra burden on the health of marginalized populations. These communities face multiple risks, including respiratory illness, cardiovascular disease, mental health issues, heat-related illness, infectious diseases, food insecurity, and other adverse health outcomes (Haq et al., 2023; Li et al., 2021). This interplay between historical discriminatory practices, environmental injustice, and climate change has created a complex web of health disparities that demand urgent attention and action.

Policymakers, researchers, and healthcare professionals can work together to implement equitable solutions and promote health equity for marginalized communities by understanding the historical context, social determinants of health, and environmental factors of redlining. Solutions should promote health equity, ensure access to quality healthcare, address environmental injustices, and build resilient communities. And, through these efforts, it should be possible to dismantle the legacy of redlining to create a more just and equitable society—where everyone has an equal opportunity to live a healthy life.

Literature Review

Redlining and Health Disparities

Research has demonstrated an intricate link between redlining, climate change, and the concentration of environmental hazards and the health of the community in these marginalized populations (Hoffman et al., 2020). Numerous studies, including scoping reviews and meta-analyses, also highlight the increased health risks associated with living in redlined areas. For instance, Li's (2021) study on heat-related illnesses in Texas cities provides specific estimates of the heightened risks these communities face. Climate change exacerbates these disparities, with marginalized populations bearing the brunt of extreme weather events and other climate-related health threats.

Redlining systematically relegates marginalized communities. Having limited resources, substandard housing, and inadequate infrastructure (Kim & Miller, 2017)—and predominantly consisting of racial and ethnic minorities—these neighborhoods are intentionally marginalized and have become hotspots for environmental hazards due to the deliberate placement of polluting industries, waste disposal sites, and highways. The clustering of these hazards creates an environment that compromises the health and well-being of its residents (Kim & Miller, 2017). As a result, residents are disproportionately exposed to elevated levels of air and water pollution, toxic substances, noise pollution, and other environmental stressors (Kim & Miller, 2017; Motairek et al., 2022; Winling & Michney, 2021).

Asthma and chronic obstructive pulmonary disease (COPD) are prevalent among individuals residing in redlined neighborhoods (Balmes, 2021). These health issues are likely due to higher levels of air pollution, including fine particulate matter (PM_{2.5}), nitrogen dioxide (NO₂), and ozone (O₃), that contribute to the development and exacerbation of respiratory conditions (Guarnieri & Balmes, 2014; Manisalidis et al., 2020). Higher rates of asthma-related emergency department visits, hospitalizations, and mortality are found in redlined communities compared to non-redlined areas (Nardone et al., 2020).

Cardiovascular disease is strongly correlated with redlining and environmental hazards (Motairek et al., 2022), including chronic exposure to air pollution, noise pollution, and limited access to green spaces, which help to increase the risk of hypertension, coronary artery disease, stroke, and other cardiovascular conditions (Motairek et al., 2022; Nardone et al., 2021). Additionally, the stressors associated with living in disadvantaged neighborhoods (such as financial strain, limited access to healthy food options, and social isolation) further contribute to cardiovascular disparities among historically marginalized populations affected by redlining (Motairek et al., 2022).

Mental health issues are another consequence of redlining and its resulting environmental inequalities. Chronic exposure to adverse living conditions, social dislocation, and limited access to mental health resources take a toll on the psychological well-being of individuals in redlined neighborhoods (Erikson et al., 2022), and studies have demonstrated higher rates of depression, anxiety, and psychological distress among these residents as compared to residents in non-redlined areas (Wang & Li, 2023).

By recognizing the historical legacy of redlining and its enduring consequences, policymakers, researchers, and healthcare professionals can develop comprehensive strategies to mitigate the health impacts on marginalized communities. These mitigation efforts should focus on improving environmental quality, enhancing housing conditions, promoting equitable access to healthcare, and addressing the political and social determinants of health (SDOH). By prioritizing equitable policies and interventions, it is possible to dismantle the environmental injustices associated with redlining and foster healthier communities for all.

Intersection of Redlining, Climate Change, and Health Disparities

Research has explored the specific ways in which climate change intersects with redlining, exacerbates health issues, and deepens existing disparities (Berberian et al., 2022; Hoffman et al., 2020; Li et al., 2021; Motairek et al., 2022), such as an increased risk of heat-related illness, infectious disease, food insecurity, and mental health challenges. These disparities underscore the importance of climate justice in addressing the impacts of climate change, as these marginalized communities often lack proper infrastructure and green spaces due to redlining and face heightened vulnerability to extreme heat events, which lead to increased morbidity and mortality rates (Nardone et al., 2021).

Urban areas, including redlined neighborhoods, often experience what is known as the “urban heat island effect,” where the concentration of concrete, asphalt, and lack of green spaces results in significantly higher temperatures (Yang et al., 2016). Consequently, the risk of heat-related illness (heat exhaustion, heat stroke)

is exacerbated—especially for individuals with limited access to air conditioning, outdoor shade, and cooling centers (Berberian et al., 2022; Hoffman et al., 2020; Li et al., 2021; Motairek et al., 2022).

Temperature and Health Disparities

Increased temperatures due to climate change affect health outcomes disproportionately across racial and ethnic groups in the United States. Studies indicate that adults of color, particularly Black, Latinx, and Native American individuals, are at higher risk of mortality and illness due to heat events compared to Whites (Norton-Smith et al., 2016; Sarfaty et al., 2014; Thompson, 2018; Wildcat, 2013). This disparity extends to non-U.S. citizens who also face elevated risks. For instance, heat-related deaths among non-U.S. citizens were predominantly Hispanic and occurred mainly in California, Arizona, and Texas (Wilder et al., 2016).

Furthermore, these temperature-related health disparities altered winter weather patterns for American Indians and Alaska Native tribes who depend on winter snows for cultural and food-based practices (Contosta et al., 2019; Doyle et al., 2013).

Spread of Infectious Disease

Climate change also influences the spread and prevalence of infectious disease (Casadevall, 2020). Warmer temperatures and altered precipitation patterns create favorable conditions for the proliferation of vectors, such as mosquitoes and ticks that transmit diseases like dengue fever, Lyme disease, and the West Nile virus (Edelson et al., 2022). These vector-borne diseases pose a significant threat to communities already burdened by the impacts of redlining. Inadequate housing conditions, limited healthcare, and inadequate resources for vector control exacerbate the vulnerability of marginalized populations to these infectious diseases.

Food Insecurity

As agricultural systems are disrupted by weather, climate change disproportionately affects redlined communities (Hasegawa et al., 2018). These marginalized neighborhoods, often characterized by limited access to grocery stores and fresh produce, already lack adequate nutrition. Climate change adds to this marginalization through decreased crop yields, increased food prices, and reduced availability of nutritious foods (Belsey-Priebe et al., 2021). Climate change contributes to a range of health issues, including malnutrition, obesity, and chronic disease, and exacerbates existing health disparities, making redlined communities more susceptible to food insecurity (Thompson-Robinson et al., 2021; Kim & Miller, 2017).

Mental Health Challenges

Climate change contributes to mental health challenges, compounding the existing burden faced by marginalized communities affected by redlining (Padhy et al., 2015). Environmental and social disruptions caused by extreme weather events, displacement, and loss of homes and livelihoods can trigger or exacerbate mental health conditions. Factors such as social capital, government assistance, and mental health literacy can also influence the capacity to adapt to these consequences (Hayes et al., 2019).

The secondary and tertiary consequences of climate change, including social disruption and population displacement, further exacerbate mental health risks (Gawrych, 2021). Despite the challenges in attributing specific mental health outcomes to climate change, the impacts are accelerating and disproportionately affect marginalized populations (Hayes et al., 2018). Redlined neighborhoods, already grappling with social and economic disadvantages, lack the necessary resources and support systems to address mental health issues effectively.

Occupational Risks

Climate change poses significant occupational risks, particularly for outdoor workers, including increased ambient temperature, air pollution, ultraviolet exposure, extreme weather, vector-borne diseases, and changes in the built environment (Applebaum, 2016; Chirico & Taino, 2018; Schulte et al., 2016). These hazards can lead to heat stress, injuries, increased chemical exposures, and undernutrition, particularly in

industries like mining, agriculture, construction, and outdoor services (Kjellstrom et al., 2014). Addressing these risks requires establishing formal monitoring systems, conducting research, implementing surveillance, performing risk assessments, and developing relevant policies (Applebaum, 2016; Schulte, 2016).

Hurricanes and Flooding

Climate change is expected to increase the intensity of hurricanes, leading to more severe flooding and property damage (Frey, 2009). This impact will be particularly pronounced on the U.S. Atlantic and Gulf Coasts, where the historical 100-year flood level is projected to occur annually by the late 21st century (Marsooli et al., 2019). The public health impact of hurricanes and major flooding, exacerbated by climate change, is a significant concern (Diaz, 2004). Urbanization further exacerbates the rainfall and flooding caused by hurricanes, as seen in the case of Hurricane Harvey in Houston (Zhang et al., 2018). These findings highlight the urgent need for effective climate change mitigation and adaptation strategies to protect vulnerable communities, including minorities, from the increasing risks of hurricane-induced flooding.

Addressing the Health Impacts of Climate Change

By promoting climate justice, policymakers and stakeholders can work towards reducing the health disparities resulting from the intersection of climate change and redlining. Climate justice recognizes that marginalized communities, including those affected by redlining, bear a disproportionate burden of climate change despite contributing less to its causes (Newell et al., 2021). So, addressing the health impacts of climate change through a climate justice lens is crucial and calls for equitable solutions that prioritize the needs and voices of these communities to ensure they are included in adaptation and mitigation efforts.

Efforts to address the health impacts of climate change in marginalized communities must include policies and interventions that enhance adaptive capacity, improve infrastructure, provide equitable access to healthcare and resources, and foster community resilience. These policies and interventions require collaboration among various stakeholders, including community leaders, healthcare providers, policymakers, and researchers. By integrating climate justice principles into decision-making processes, it may be possible to create sustainable and equitable solutions that mitigate the health impacts of climate change on marginalized communities affected by redlining.

Family Medicine's Role in Climate Change Health Disparities

Family medicine physicians play a pivotal role in addressing the multifaceted challenges arising from the intersection of redlining, climate change, and health disparities (Wellbery, 2019). This section highlights the unique position of family medicine physicians in advocating for equitable healthcare access, engaging with communities, and implementing strategies to mitigate climate-related health issues while emphasizing the importance of interdisciplinary collaborations to address these complex challenges effectively.

A 2019 study by Boland and Temte found that patients and physicians are concerned about climate change and its health implications (Wellbery, 2019). Forty-four percent of patients believe climate change is currently affecting their community's health, while 64% of physicians believe it is impacting their patients' health. Despite this concern, only 6% of patients ranked their physician as a top source of information on climate change, indicating that physicians are underutilized as sources of information on this topic. The results also revealed that patients highly trust their physicians regarding environmental issues, with a median trust score of 4 out of 5, while only 17% of physicians feel comfortable counseling patients about climate change and health, and 31% believe physicians should actively discuss climate change with patients (Wellbery, 2019).

Family medicine physicians are uniquely positioned to address the health disparities exacerbated by climate change, given their close ties to communities and their holistic approach to patient care. However, to effectively combat these disparities, it is essential to move beyond general advocacy and education to more

specific, actionable strategies. Following are examples of how family medicine physicians have successfully led or participated in initiatives to address climate change-related health disparities.

Educating Patients About Infectious Disease Risks

Climate change significantly impacts the emergence and spread of infectious diseases, particularly in developing nations (Dhara et al., 2013; Patz et al., 1996). This is due to the influence of climatic factors on disease transmission, such as changes in vector range and reproductive rates, and the potential for increased water-borne illnesses. However, the relationship between climate change and infectious disease is complex and influenced by various factors (Lafferty, 2009, 2010). Therefore, family medicine practitioners must educate their patients about the potential health implications of climate change and the preventive measures they can take.

In regions where climate change has increased vector-borne diseases, family medicine physicians have taken the lead in educating their patients about the risks (Kircher et al., 2022). For instance, in areas with a rising incidence of malaria due to changing weather patterns, physicians have promoted the use of mosquito nets and provided information on their proper usage (Osero et al., 2006; Robertus et al., 2023). Such educational initiatives have resulted in increased adoption of preventive measures, reducing the risk of disease transmission (Robertus et al., 2023).

Professional Society Resources

Guarnieri and Balmes (2014) mention that professional societies can provide a wealth of resources that family medicine physicians can leverage. These resources include guidelines, best practices, and case studies highlighting successful interventions led by physicians to address climate change-related health disparities. However, the specific role of family medicine and primary health care in addressing the climate crisis remains to be fully explored (Govender, 2023).

Challenging Physician Attitudes

Boland and Temte (2019) highlight a concerning statistic: Only one-third of primary care physicians in Wisconsin believe that discussing climate change with patients is part of their role. If this attitude is prevalent across the primary care community, it could be a significant barrier to addressing climate change-related health disparities. Family medicine physicians can play a role in challenging and changing this mindset by emphasizing the direct and indirect health impacts of climate change and the importance of physician–patient discussions on this topic.

While general advocacy, education, and collaboration are essential, specific, actionable strategies can make a tangible difference in addressing climate change-related health disparities. By highlighting successful interventions and providing clear examples, family medicine physicians can inspire their peers to take meaningful action in their own communities and organizations.

As frontline healthcare providers, family medicine physicians are well-positioned to advocate for equitable healthcare access in redlined communities (Newell et al., 2021). They deeply understand the healthcare needs and challenges of marginalized populations, including limited access to quality healthcare services, transportation barriers, and socioeconomic constraints (Boland & Temte, 2019). Family medicine physicians can actively engage in policy discussions and advocate for policies that promote health equity, as well as address the underlying social determinants of health perpetuated by redlining. By leveraging their expertise and advocating for improved access to healthcare services, frontline healthcare providers can help bridge the gap in healthcare disparities and ensure that all individuals—regardless of their neighborhood or socioeconomic status—have equal opportunities for health and well-being (Gaskin et al., 2012).

Family medicine physicians are crucial when engaging with communities affected by redlining and climate change. Physicians can develop culturally sensitive and community-responsive healthcare approaches through active listening to community members and understanding their unique concerns, challenges, and needs (Gaskin et al., 2012). Building trust and establishing meaningful resident relationships are essential to effectively addressing the health impacts of redlining and climate change. Family medicine physicians can work collaboratively with community organizations, leaders, and residents to develop tailored interventions, health promotion initiatives, and education programs that address the specific health needs of marginalized communities. By engaging communities in a participatory approach, physicians can empower residents to take an active role in improving their health and well-being (Kovach et al., 2019; Maïga et al., 2021).

In addressing climate-related health issues, family medicine physicians can play a critical role in implementing strategies to mitigate and adapt to the changing climate by incorporating climate change considerations into clinical practice. Family medicine physicians can promote preventive measures and counsel patients on strategies to protect themselves from climate-related health risks (Abramson & Kark, 2019). For instance, physicians can provide guidance on heatwave preparedness and emphasize the importance of staying hydrated, seeking lower-temperature environments, and recognizing the signs of heat-related illnesses (Crowley, 2016; Wilson et al., 2011). Physicians can also educate patients about vector-borne diseases and the importance of personal protection measures, such as using insect repellents and wearing protective clothing (Parker et al., 2019). By integrating climate-related health education into routine patient care, family medicine physicians can increase awareness and empower individuals to make informed decisions to safeguard their health in the face of climate change.

Interdisciplinary collaborations are essential to effectively addressing the complex challenges at the intersection of redlining, climate change, and health disparities (Winch et al., 1992). Family medicine physicians can collaborate with public health professionals, urban planners, environmental scientists, community organizers, and policymakers to develop holistic approaches to promote health equity and resilience (Goldman et al., 2010). These collaborations can inform policy changes, urban planning decisions, and healthcare interventions to address the root causes of health disparities, while also mitigating the health impacts of climate change. Family medicine physicians can contribute to comprehensive and sustainable solutions that foster health and well-being in redlined communities by pooling expertise, resources, and perspectives from various disciplines.

Family medicine physicians hold a unique position in addressing the complex challenges that arise at the intersection of redlining, climate change, and health disparities. By advocating for equitable healthcare access, engaging with communities, and implementing strategies to mitigate climate-related health issues, family medicine physicians can significantly impact the health and well-being of marginalized populations. Through interdisciplinary collaborations, physicians can contribute to creating resilient and equitable healthcare systems to address the underlying social and environmental determinants of health, as well as to promote health equity for all.

Addressing the Intersection of Redlining and Climate Change

The historical implications of redlining, as well as its mounting challenges posed by climate change, undeniably contribute to the health disparities we observe today. While these issues are vast, it is essential to recognize and highlight current efforts that are making a difference. By focusing on these successful initiatives, we can provide family physicians with tangible points of engagement and inspire further action.

Successful Community-Building Initiatives

A range of community-building initiatives were implemented to counter the decline of urban neighborhoods due to redlining (Naparstek, 1997). For example, in Washington, D.C., the community reinvestment

movement successfully lobbied for key federal legislation. This legislation included the Home Mortgage Disclosure Act and the Community Reinvestment Act to address redlining and gentrification (Lloyd, 2014) in affected neighborhoods. The impact of these initiatives on poverty reduction, however, is not well-documented (Fraser & Kick, 2005).

Addressing Social Determinants of Health (SDOH)

Some studies demonstrated the importance of addressing social determinants of health (SDOH), particularly in the context of redlining. Baker et al. (2005) and Barten et al. (2007) stress the need for a comprehensive, integrated approach that considers the broader socioeconomic and contextual factors affecting health. Smith et al. (2008) further underscores the need for action, advocating for a focus on early years, the environment, working conditions, and gender equity. Finally, Houlihan and Leffler (2019) highlight the potential for improved outcomes and reduced costs through a holistic approach incorporating social factors. Collectively, these studies underscore the urgency and potential benefits of addressing social determinants of health, including those related to redlining.

High-Level Policy Efforts

Several high-level policy efforts to address redlining have been attempted. However, these policies have also led to racial disparities in the benefits of rising property values. For example, Robertson et al. (2022) found that federal place-based policies that aim to reinvest in disadvantaged neighborhoods have targeted historically redlined areas.

Jagger et al. (2012) emphasized the importance of national-level buy-in for redlining safeguards, suggesting there is a need for harmonized policies and capacity building. Lloyd (2014) highlighted the role of community development legislation, such as the Home Mortgage Disclosure Act and the Community Reinvestment Act, in addressing redlining. And Wachter and Guttentag (1980) provided a comprehensive overview of redlining and public policy, laying the groundwork for subsequent research in this area.

Empowering Patients and Physicians to Address Redlining

Oandasan and Barker (2003) and Jacobs et al. (2003) highlight the need for community-responsive physicians who can address health disparities, including those caused by redlining. Both studies emphasize the importance of physicians being aware of social determinants of health, as well as possessing the tools to address them. Azzawi (2021) and Perritt (2020) further underscore the role of physicians in addressing socioeconomic disparities and criminalization within the healthcare system, respectively. These studies collectively suggest that empowering patients and physicians to address community redlining requires a multifaceted approach that includes education, cross-cultural understanding, and advocacy.

While the challenges posed by redlining and climate change are daunting, numerous ongoing efforts are making a difference. By highlighting these initiatives and providing family physicians with actionable steps, we can work towards a future where the health disparities rooted in historical injustices are a thing of the past.

Discussion

An examination of how redlining links to the concentration of environmental hazards and specific health impacts reveals that it continues to perpetuate structural inequalities and leads to health disparities in marginalized populations (Enterprise Community Partners, Inc., 2021). The intersection where redlining, climate change, and health disparities meet is a complex and pressing issue that demands urgent attention and action. This section aims to delve deeper into the implications and potential solutions related to this intersection.

Redlining systematically relegated marginalized communities of predominantly racial and ethnic minorities to neighborhoods having limited resources, substandard housing, and inadequate infrastructure. The intentional placement of undesirable facilities in these neighborhoods, such as polluting industries and waste disposal sites, perpetuated environmental injustice and exposed residents to harmful toxins and pollutants. As a result, individuals living in redlined neighborhoods are more susceptible to a range of health disparities and adverse health outcomes.

Respiratory illness, cardiovascular disease, and mental health issues are among the notable health impacts associated with redlining. Moreover, chronic exposure to air pollution, noise pollution, and limited access to green space increases the risk of cardiovascular diseases. Additionally, the stressors associated with living in disadvantaged neighborhoods further contribute to cardiovascular disparities among marginalized populations affected by redlining. Mental health issues (such as depression, anxiety, and psychological distress) are also prevalent among residents in redlined communities due to persistent stressors associated with adverse living conditions and limited access to mental health resources.

Climate change exacerbates the health challenges faced by marginalized redlined communities. Heat-related illnesses, infectious diseases, food insecurity, and mental health issues are among the significant health impacts associated with climate change. Urban areas, including redlined neighborhoods, often experience higher temperatures due to the “urban heat island effect” that increases the risk of heat-related illnesses, especially for those with limited access to cooling centers and outdoor shade (Yang et al., 2016). Climate change also creates favorable conditions for the spread of infectious diseases transmitted by vectors like mosquitoes and ticks, which pose a significant threat to communities burdened by redlining. Furthermore, climate change disrupts agricultural systems, leading to food insecurity that further exacerbates existing health disparities. The environmental and social disruptions caused by climate change also contribute to mental health challenges, compounding the existing burden faced by marginalized communities affected by redlining.

When addressing these interconnected challenges of redlining, climate change, and health challenges, it is crucial to adopt a comprehensive and equitable approach, and family medicine physicians are pivotal in advocating for equitable healthcare access. Family Medicine Physicians engage with communities and implement strategies to mitigate climate-related health issues. They can also actively participate in policy discussions and collaborate with community organizations, leaders, and residents to develop tailored interventions, health promotion initiatives, and education programs that address the specific health needs of marginalized communities. By integrating climate-related health education into routine patient care, family medicine physicians can increase awareness and empower individuals to make informed decisions to safeguard their health in the face of climate change.

Successful family medicine-led interventions provide examples of how healthcare providers can make a positive impact. Community-based climate health resilience programs, mobile health clinics, climate-ready health centers, and partnerships for environmental justice demonstrate the effectiveness of interdisciplinary collaborations and community engagement in addressing the health impacts of redlining and climate change. These interventions emphasize the importance of empowering communities, improving access to healthcare services, and building resilience to climate-related health challenges.

To address the critical “access to healthcare” issue for individuals residing in historically redlined areas, it is imperative to consider the compounded challenges posed by climate change. These communities already grapple with the long-term consequences of systemic discrimination and face increased vulnerability to the health impacts of climate change, including heightened risks of respiratory illnesses, cardiovascular diseases, and heat-related conditions. The scarcity of family medicine physicians and other primary care practitioners in these communities exacerbates these vulnerabilities and limits resident access to essential healthcare services.

This lack of community healthcare access not only contributes to the overburdening of local emergency departments with cases that could have been managed through routine care but also underscores the importance of addressing healthcare disparities as part of a broader strategy to combat the effects of climate change on vulnerable populations. The role of family medicine physicians in leading community-based initiatives is crucial, but their effectiveness is contingent upon their presence within these underserved areas. Strategies to recruit and retain healthcare professionals in redlined communities must be a priority, alongside efforts to mitigate the adverse effects of climate change on these populations.

The healthcare access discussion underscores the broader issue of healthcare equity and the social determinants of health (SDOH) that disproportionately affect marginalized communities. Effectively addressing the issue of access in formerly redlined areas subject to climate change impacts requires a multifaceted approach. This approach should encompass not only the recruitment of physicians and other healthcare professionals to underserved communities but also the implementation of policies and programs that address the broader social determinants of health.

Collaborations between healthcare providers, community organizations, and policymakers are vital to creating sustainable solutions that address both the immediate and long-term healthcare needs of redlined communities. To do this, understanding specific needs and challenges is essential for developing targeted interventions to improve access to healthcare, so community engagement is important. Additionally, leveraging technology (such as telemedicine) can play a role in bridging the gap in access to care (Daniel & Sulmasy, 2015).

Family medicine physicians can help advocate for equitable healthcare access, engage with communities, and implement strategies to mitigate climate-related health issues by addressing the intersection of redlining, climate change, and health disparities. Doing so requires a comprehensive and equitable approach, but by focusing on the suggested strategies, it is possible to dismantle the barriers to healthcare access created by historical injustices—and to ensure that all individuals, regardless of geographic location or socioeconomic status, have the opportunity to achieve optimal health outcomes.

Conclusion

Redlining, a discriminatory practice that perpetuates racial segregation and socioeconomic disparities, has enduring effects on marginalized populations. The environmental hazard concentrations, such as pollution and inadequate infrastructure, contribute to a range of health disparities and adverse health outcomes in these communities. Furthermore, climate change helps exacerbate these challenges by disproportionately affecting vulnerable communities previously affected by redlining.

A complex web of challenges that demand urgent attention and action is found at the intersection of redlining, climate change, and health disparities. Policymakers, researchers, and healthcare professionals must work together to implement equitable solutions to promote health equity for marginalized communities, but they first must recognize the impact that historical context, social determinants of health, and environmental factors have had on developing effective strategies to address these interconnected issues.

Family medicine physicians play a pivotal role in addressing the challenges caused by redlining. They can advocate for equitable healthcare access, engage with communities, and implement strategies to mitigate climate-related health issues. By integrating climate change considerations into clinical practice, engaging in interdisciplinary collaborations, and implementing successful interventions, family medicine physicians can contribute to comprehensive and sustainable solutions that foster health and well-being in redlined communities.

Addressing the complex challenges arising from the intersection of redlining, climate change, and health disparities requires a comprehensive and collaborative approach. Family medicine physicians and other stakeholders should be responsible for advocating for equitable healthcare, engaging with communities, and implementing strategies to mitigate climate-related health impacts. By working together, we can strive towards a future where all individuals—regardless of their neighborhood or socioeconomic status—have equal opportunities for health and well-being.

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