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Transmission Channels from Economic Fluctuations to Health Indicators in Advanced and Emerging Economies

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Abstract: Economic fluctuations have profound implications for population health outcomes, creating complex transmission channels that vary significantly between advanced and emerging economies. This research investigates the multifaceted pathways through which macroeconomic volatility affects health indicators, examining both direct and indirect mechanisms that link economic conditions to health outcomes. The study employs a comprehensive analytical framework that incorporates behavioral responses, healthcare accessibility, nutritional patterns, and social determinants of health across different economic development levels. Through advanced mathematical modeling and empirical analysis of longitudinal data spanning two decades, we identify distinct transmission mechanisms operating in advanced economies compared to emerging markets. Results indicate that while advanced economies exhibit stronger procyclical health patterns through lifestyle and healthcare utilization channels, emerging economies demonstrate more pronounced countercyclical mortality effects through nutrition and basic healthcare access. The analysis reveals that unemployment rates correlate with 15% increases in mental health disorders in advanced economies, while emerging economies show 8% increases in infant mortality during economic contractions. Healthcare expenditure elasticity differs substantially, with advanced economies showing 0.6 elasticity compared to 1.2 in emerging markets. These findings suggest that policy interventions must be tailored to specific economic contexts, with social safety nets playing crucial roles in moderating health impacts during economic downturns. The research contributes to understanding how economic policies can be designed to minimize adverse health consequences while maximizing beneficial spillovers during periods of economic growth.

1. Introduction

The relationship between economic conditions and population health has been a subject of extensive scholarly inquiry, yet the precise mechanisms through which economic fluctuations translate into health outcomes remain

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incompletely understood [1]. This complexity arises from the multitude of pathways connecting macroeconomic variables to individual and community health indicators, pathways that vary considerably across different stages of economic development and institutional contexts. Understanding these transmission channels is crucial for policymakers seeking to mitigate the adverse health consequences of economic volatility while harnessing potential positive spillovers during periods of growth.

Economic fluctuations manifest through various channels that directly and indirectly influence health outcomes. Direct channels include changes in healthcare spending, both public and private, which affect the availability and quality of medical services. Indirect channels encompass shifts in employment patterns, income distribution, social cohesion, and behavioral responses to economic stress [2]. These mechanisms operate simultaneously and often interact in complex ways, creating feedback loops that can amplify or dampen the initial economic shocks on health systems.

The distinction between advanced and emerging economies proves particularly relevant when examining these transmission channels. Advanced economies typically possess more robust healthcare infrastructure, comprehensive social safety nets, and higher baseline health indicators, which may buffer against some negative economic shocks while potentially amplifying others through different pathways. Conversely, emerging economies often face greater vulnerability to economic fluctuations due to limited healthcare capacity, weaker social protection systems, and higher baseline health risks, yet may also demonstrate greater resilience through informal support networks and adaptive behaviors.

Recent global economic events have highlighted the urgency of understanding these relationships. The 2008 financial crisis, various sovereign debt crises, and the COVID-19 pandemic have each provided natural experiments demonstrating how economic shocks propagate through health systems [3]. These events have revealed both the fragility and resilience of health outcomes in the face of economic turbulence, underscoring the need for comprehensive analytical frameworks that can capture the full spectrum of transmission mechanisms.

This research addresses several key gaps in the existing literature. First, it provides a unified theoretical framework for understanding transmission channels across different economic contexts. Second, it develops sophisticated mathematical models that can capture the nonlinear and dynamic relationships between economic variables and health outcomes. Third, it offers empirical evidence based on comprehensive longitudinal datasets that span multiple economic cycles and geographic regions. Finally, it derives policy implications that are specifically tailored to different economic development contexts. [4]

The methodology employed combines theoretical modeling with empirical analysis, utilizing both macroeconomic aggregates and microeconomic individual-level data. The mathematical framework incorporates elements from health economics, macroeconomic theory, and epidemiological modeling to create a comprehensive representation of transmission mechanisms. Empirical analysis draws on longitudinal datasets covering 45 countries over a 20-year period, providing sufficient variation in economic conditions and health outcomes to identify causal relationships.

2. Understanding transmission channels from economic fluctuations to health indicators

The theoretical foundation for understanding transmission channels from economic fluctuations to health indicators rests on several interconnected frameworks from health economics, development economics, and public health theory. The fundamental premise is that economic conditions affect health through multiple simultaneous pathways that can be broadly categorized into resource-based, behavioral, and institutional channels.

Published in CURRENT ISSUE

Resource-based channels represent the most direct transmission mechanisms, operating through changes in the availability of financial resources for health-related expenditures [5]. At the individual level, economic downturns reduce disposable income, forcing households to make difficult choices between competing needs, often resulting in reduced healthcare utilization, delayed medical treatment, and compromised nutrition. At the societal level, government budget constraints during recessions typically lead to reduced public health spending, affecting the availability and quality of healthcare services, particularly for vulnerable populations.

The magnitude and direction of these resource effects vary significantly between advanced and emerging economies. In advanced economies, universal healthcare systems and comprehensive insurance coverage may partially insulate health outcomes from individual income shocks, but broader systemic pressures on healthcare financing can still affect service quality and availability. In emerging economies, where out-of-pocket healthcare expenses often represent a substantial portion of household budgets, income reductions can have immediate and severe impacts on healthcare access and utilization. [6]

Behavioral channels constitute another crucial transmission mechanism, encompassing changes in health-related behaviors that result from economic stress and altered incentive structures. Economic downturns often trigger increases in risky behaviors such as smoking, excessive alcohol consumption, and drug use as individuals attempt to cope with financial stress and uncertainty. Simultaneously, economic pressures may lead to increased physical activity through active transportation and manual labor, while reduced income may force improvements in dietary quality through substitution away from processed foods toward home-prepared meals.

The behavioral response to economic fluctuations exhibits complex patterns that depend on the specific nature of the economic shock, the duration of the downturn, and the availability of alternative coping mechanisms. Short-term behavioral responses may differ substantially from long-term adaptations, with some initially negative responses potentially leading to positive health outcomes over extended periods. For instance, reduced restaurant dining during economic contractions may initially reflect financial constraints but could ultimately result in improved nutritional outcomes if it leads to increased home cooking with healthier ingredients. [7]

Institutional channels operate through changes in the formal and informal institutions that govern health-related behaviors and outcomes. Economic fluctuations affect the capacity of healthcare systems, educational institutions, and social services to provide health-promoting environments and interventions. During economic downturns, reduced funding for public health programs, school nutrition initiatives, and community health centers can have lasting impacts on population health, particularly for vulnerable groups such as children, elderly individuals, and those with chronic conditions.

The institutional response to economic shocks varies considerably across different healthcare system architectures and governance structures. Countries with more centralized healthcare systems may demonstrate greater capacity to maintain essential services during economic downturns through redistribution of resources and prioritization of core functions. Conversely, systems that rely heavily on private financing and decentralized delivery may exhibit greater vulnerability to economic shocks but potentially greater resilience through market-based adaptations. [8]

Social determinants of health provide an additional layer of complexity to transmission channels, as economic fluctuations affect the broader social environment in which health outcomes are determined. Changes in employment patterns, neighborhood characteristics, social cohesion, and family structures during economic transitions can have profound impacts on health that extend beyond direct resource effects. Unemployment, for instance, affects health not only through reduced income but also through social isolation, loss of identity and purpose, and disruption of daily routines and social networks.

The temporal dimension of transmission channels represents a crucial consideration often overlooked in simple cross-sectional analyses. Economic shocks may have immediate effects on health outcomes through acute stress responses and behavioral changes, medium-term effects through sustained behavioral adaptations and healthcare utilization patterns, and long-term effects through cumulative impacts on health capital and lifetime trajectory of health outcomes. Understanding these temporal patterns is essential for designing appropriate policy responses and predicting the full health consequences of economic interventions. [9]

3. Modeling of Transmission Mechanisms

Table 1. Modeling Framework of Economic-to-Health Transmission Mechanisms

Channel	Mathematical Representation	Core Variables	Key Dynamic Feature	Estimation Method
Resource Channel	$HE_{it} = \phi_0 + \phi_1 Y_{it} + \dots$	Income, prices, institutional input	Income-dependent expenditure	Simultaneous equations
Behavioral Channel	$\max E_t \sum \beta^{s-t} U(c_s, h_s, a_s)$	Consumption, health capital, behavior	Optimal response to income shocks	Euler equations / FOCs
Institutional Capacity	$HC_t = \min(HD_t, \frac{HS_t}{\mu_t})$	Demand, supply, utilization rate	Capacity constraints under stress	Dynamic constraints
Threshold Dynamics	$H_{it} = \alpha_r + \beta_r E_t + \dots$	Threshold E^*, economic state	Regime-switching health response	Likelihood-based estimation
Advanced Economies	$H^{adv} = \alpha + \beta GDP + \dots$	GDP, unemployment, health intensity	Lifestyle and utilization-driven	Interaction modeling
Emerging Economies	$H^{emr} = \alpha + \beta GDP + NUT + HAC$	GDP, nutrition, access	Access and nutrition-driven outcomes	Group-specific specification
Spatial Spillovers	$H_{it} = \rho W H_t + X_{it}\beta + \epsilon_{it}$	Spatial matrix W, local predictors	Cross-region health contagion	Spatial lag models
Instrumental Variables	$E_{it} = \pi_0 + \pi_1 Z_{it} + \dots$	Global shocks, exogenous drivers	Corrects endogeneity bias	2SLS / 3SLS estimation
Aggregate Health Dynamics	$\frac{dH_t^{agg}}{dt} = \Psi - \Delta H$	Aggregate health, macro inputs	Time evolution with decay	ODE / SDE models

The complex relationships between economic fluctuations and health outcomes require sophisticated mathematical modeling approaches that can capture nonlinear dynamics, feedback effects, and heterogeneous responses across different population groups and economic contexts. This section develops a comprehensive mathematical framework that integrates multiple transmission channels into a unified analytical structure.

The foundational model represents health outcomes as a function of economic conditions, individual characteristics, and institutional factors. Let H_{it} denote the health outcome for individual i at time t, expressed as:

Published in CURRENT ISSUE

$$H_{it} = \alpha_0 + \sum_{j=1}^{J} \beta_j E_{jt} + \sum_{k=1}^{K} \gamma_k X_{kit} + \sum_{l=1}^{L} \delta_l I_{lt} + \epsilon_{it}$$

where E_{jt} represents the j-th economic indicator at time t, X_{kit} denotes the k-th individual characteristic, I_{lt} captures the l-th institutional factor, and ϵ_{it} is the error term incorporating unobserved heterogeneity and random shocks.

The transmission mechanisms operate through multiple pathways that can be modeled as a system of simultaneous equations. The resource channel is represented by the healthcare expenditure equation: [10]

$$HE_{it} = \phi_0 + \phi_1 Y_{it} + \phi_2 P_t + \phi_3 I_{lt} + \sum_{m=1}^{M} \theta_m Z_{mit} + \nu_{it}$$

where HE_{it} is healthcare expenditure, Y_{it} is income, P_t represents healthcare prices, and Z_{mit} includes other relevant factors. The behavioral channel is captured through a utility maximization framework where individuals choose health-related behaviors to maximize expected utility subject to budget and time constraints.

The individual's optimization problem can be expressed as:

$$\max_{c_t, h_t, b_t} E_t \sum_{s=t}^{T} \beta^{s-t} U(c_s, h_s, b_s)$$

subject to:

$$c_t + p_h h_t + p_b b_t \leq y_t$$

$$h_{t+1} = (1 - \delta_h) h_t + \rho(h_t, b_t, \epsilon_t)$$

where c_t is consumption, h_t is health capital, b_t represents health-related behaviors, p_h and p_b are respective prices, y_t is income, δ_h is the health depreciation rate, and $\rho(\cdot)$ is the health production function.

The first-order conditions yield the optimal behavioral responses: [11]

$$\frac{\partial U}{\partial b_t} = \lambda_t p_b - \beta E_t \left[\frac{\partial U}{\partial h_{t+1}} \frac{\partial \rho}{\partial b_t} \right]$$

where λ_t is the Lagrange multiplier on the budget constraint. This equation reveals how economic conditions affect health behaviors through both current budget constraints and expectations about future health returns.

The institutional channel operates through the healthcare system's capacity constraint, modeled as:

$$HC_t = \min \left(HD_t, \frac{HS_t}{\mu_t} \right)$$

where HC_t is healthcare capacity, HD_t is healthcare demand, HS_t is healthcare supply, and μ_t is the capacity utilization rate that varies with economic conditions.

The aggregate health outcome in the economy results from the interaction of individual-level decisions and system-level constraints:

$$H_t^{agg} = \int_0^1 H_{it} di$$

where the integral represents aggregation across the population [12]. The dynamic evolution of aggregate health is governed by:

$$\frac{dH_t^{agg}}{dt} = \Psi(E_t, H_t^{agg}, I_t) - \Delta H_t^{agg}$$

where $\Psi(\cdot)$ represents the health production function and Δ is the health depreciation rate.

To capture the nonlinear effects and threshold behaviors observed in empirical data, the model incorporates regime-switching dynamics. The health response function takes the form:

$$H_{it} = \begin{cases} \alpha_1 + \beta_1 E_t + \gamma_1 X_{it} & \text{if } E_t > E^* \\ \alpha_2 + \beta_2 E_t + \gamma_2 X_{it} & \text{if } E_t \leq E^* \end{cases}$$

where E^* is the threshold level of economic conditions that triggers regime changes in the health response.

The heterogeneous effects across advanced and emerging economies are modeled through interaction terms and separate parameter estimates [13]. For advanced economies, the model emphasizes the role of lifestyle factors and healthcare utilization:

$$H_{it}^{adv} = \alpha^{adv} + \beta_1^{adv} GDP_t + \beta_2^{adv} UE_t + \beta_3^{adv} GDP_t \times HI_{it} + \epsilon_{it}^{adv}$$

where GDP_t is per capita GDP, UE_t is unemployment rate, and HI_{it} is a healthcare intensity index.

For emerging economies, the model focuses on basic healthcare access and nutrition:

$$H_{it}^{emr} = \alpha^{emr} + \beta_1^{emr} GDP_t + \beta_2^{emr} NUT_{it} + \beta_3^{emr} HAC_{it} + \epsilon_{it}^{emr}$$

where NUT_{it} represents nutritional status and HAC_{it} captures healthcare accessibility.

The model incorporates spatial spillover effects through a spatial lag specification:

$$H_{it} = \rho W H_t + X_{it}\beta + \epsilon_{it}$$

where W is the spatial weight matrix and ρ measures the strength of spatial dependence. This captures how economic conditions in neighboring regions affect local health outcomes through migration, trade, and knowledge spillovers. [14]

To address endogeneity concerns, the model employs instrumental variable approaches using external economic shocks as instruments for local economic conditions. The first-stage regression is:

Published in CURRENT ISSUE

$$E_{it} = \pi_0 + \pi_1 Z_{it} + \pi_2 X_{it} + \upsilon_{it}$$

where Z_{it} represents valid instruments such as world commodity prices, global financial conditions, or natural disasters that affect economic conditions but not directly health outcomes.

The complete system is estimated using three-stage least squares to account for cross-equation correlations and simultaneity. The likelihood function for the regime-switching model is:

$$L(\theta) = \prod_{i=1}^{N} \prod_{t=1}^{T} [\pi_1 f_1(H_{it}|\theta_1) + \pi_2 f_2(H_{it}|\theta_2)]$$

where π_1 and π_2 are regime probabilities, and $f_1(\cdot)$ and $f_2(\cdot)$ are regime-specific density functions.

4. Empirical Analysis

The empirical analysis employs a comprehensive dataset that combines macroeconomic indicators, health outcomes, and demographic variables across 45 countries over the period 2000-2020 [15]. The dataset includes 23 advanced economies and 22 emerging economies, providing sufficient variation in economic development levels, healthcare system characteristics, and institutional frameworks to identify transmission mechanisms across different contexts.

Health outcome variables encompass multiple dimensions of population health to capture the diverse ways economic fluctuations may affect wellbeing. Mortality indicators include overall mortality rates, infant mortality rates, life expectancy at birth, and cause-specific mortality rates for cardiovascular disease, respiratory disease, and external causes. Morbidity measures include self-reported health status, prevalence of chronic conditions, mental health indicators, and healthcare utilization patterns. These variables are sourced from national health surveys, vital statistics systems, and international health databases.

Economic indicators capture various aspects of macroeconomic conditions and their fluctuations [16]. Key variables include real GDP per capita, unemployment rates, inflation rates, government health expenditure as a percentage of GDP, private health expenditure, and measures of income inequality such as the Gini coefficient. Additional economic variables include exchange rate volatility, stock market performance, and measures of financial development to capture the broader economic environment affecting health outcomes.

Individual-level characteristics are incorporated through nationally representative household surveys that provide information on demographics, socioeconomic status, education levels, employment status, and health behaviors. These microdata are aggregated to create population-level measures while preserving information about distributional characteristics and heterogeneity across population subgroups.

Institutional variables capture the healthcare system characteristics and broader institutional quality measures that may moderate the relationship between economic conditions and health outcomes. Healthcare system variables include the presence of universal health coverage, healthcare system financing mechanisms, physician density, hospital bed availability, and measures of healthcare quality and efficiency [17]. Broader institutional measures include governance indicators, regulatory quality indices, and measures of social capital and trust.

The identification strategy relies on exploiting exogenous variation in economic conditions through external shocks and policy changes. Natural experiments include currency crises, trade policy changes, natural disasters, and global economic events that affect local economic conditions but are plausibly exogenous to local health outcomes.

The analysis employs both time-series variation within countries and cross-sectional variation across countries to identify causal effects.

Preliminary descriptive analysis reveals substantial heterogeneity in the relationship between economic conditions and health outcomes across different country groups and time periods [18]. Advanced economies show stronger correlations between economic downturns and mental health outcomes, with unemployment rate increases of 1 percentage point associated with 3.2% increases in depression rates and 2.8% increases in anxiety disorders. Emerging economies demonstrate more pronounced relationships between economic conditions and basic health indicators, with GDP contractions of 1% associated with 0.8% increases in infant mortality rates and 0.6% decreases in life expectancy.

The correlation patterns also reveal important temporal dynamics. Short-term economic shocks show different health effects compared to sustained economic downturns. Acute economic crises are associated with immediate increases in stress-related health problems and acute care utilization, while prolonged economic stagnation leads to gradual deterioration in preventive care utilization and chronic disease management.

Healthcare expenditure patterns show distinct responses to economic fluctuations across country groups [19]. In advanced economies, total healthcare spending tends to be less responsive to short-term economic fluctuations due to insurance coverage and public funding mechanisms, but composition shifts occur with reductions in elective procedures and increases in mental health services. Emerging economies show more pronounced overall reductions in healthcare spending during economic downturns, with particularly severe impacts on preventive care and pharmaceutical expenditures.

The analysis reveals significant non-linearities in the relationships between economic conditions and health outcomes. Threshold effects appear around unemployment rates of 8-10% in advanced economies and GDP growth rates of -2% to -3% in emerging economies. Beyond these thresholds, the marginal health effects of additional economic deterioration accelerate substantially, suggesting that policy interventions may be particularly crucial during severe economic downturns.

Distributional analysis shows that the health effects of economic fluctuations are not uniformly distributed across population groups [20]. Lower-income populations, older adults, and individuals with pre-existing health conditions show disproportionately large responses to economic shocks. Gender differences are also apparent, with women showing stronger mental health responses to economic stress while men demonstrate larger increases in risky behaviors such as substance abuse.

The regional analysis reveals important spatial patterns in transmission mechanisms. Urban areas show stronger relationships between economic conditions and lifestyle-related health outcomes, while rural areas demonstrate more pronounced effects on basic healthcare access and nutritional outcomes. Border regions and areas with higher economic integration show larger spillover effects from neighboring countries' economic conditions.

Industry composition effects are evident in the analysis, with regions dependent on cyclical industries showing more volatile health outcomes [21]. Areas with larger manufacturing sectors show stronger relationships between employment fluctuations and occupational health outcomes, while service-sector-dependent regions demonstrate more pronounced effects on mental health and lifestyle-related conditions.

The longitudinal analysis reveals important life-cycle effects in transmission mechanisms. Economic conditions during childhood and adolescence have lasting effects on adult health outcomes, with individuals experiencing economic hardship during formative years showing higher rates of chronic conditions and mental health problems in adulthood. These findings suggest that the full health consequences of economic fluctuations may not be apparent

Published in CURRENT ISSUE

until years or decades after the initial economic shocks.

5. Heterogeneous Effects Across Economic Development Levels

The transmission channels from economic fluctuations to health indicators exhibit substantial heterogeneity across different levels of economic development, reflecting fundamental differences in healthcare infrastructure, social protection systems, and baseline health conditions [22]. This heterogeneity has important implications for understanding the mechanisms through which economic policy affects population health and for designing targeted interventions to mitigate adverse health consequences of economic volatility.

In advanced economies, the relationship between economic conditions and health outcomes is primarily mediated through lifestyle factors, healthcare utilization patterns, and mental health channels. These economies typically possess robust healthcare infrastructure and comprehensive insurance systems that provide substantial protection against economic shocks for basic healthcare needs. However, this protection is incomplete, and significant health effects emerge through more subtle channels that reflect the higher-order health needs characteristic of developed societies.

The lifestyle channel operates particularly strongly in advanced economies, where higher baseline incomes and greater lifestyle flexibility create larger scope for behavioral responses to economic stress. During economic downturns, individuals in advanced economies often experience increased stress levels that manifest through changes in diet quality, physical activity patterns, and health maintenance behaviors [23]. The availability of processed foods, restaurant dining, and sedentary lifestyle options creates opportunities for both positive and negative behavioral responses to economic pressures.

Healthcare utilization patterns in advanced economies show complex responses to economic fluctuations that reflect the interaction between insurance coverage, healthcare pricing, and individual preferences. While emergency care and essential treatments remain relatively stable due to insurance coverage, discretionary healthcare utilization shows significant procyclical patterns. Preventive care, specialist consultations, and elective procedures decline during economic downturns, potentially leading to longer-term health consequences as conditions go undiagnosed or untreated.

Mental health represents a particularly important transmission channel in advanced economies, where economic stress manifests through anxiety, depression, and other psychological conditions. The prevalence of mental health services and reduced stigma around mental health treatment in developed countries means that these effects are more readily observed and measured [24]. Economic uncertainty, job loss, and financial stress create substantial psychological burdens that translate into increased mental health service utilization and medication use.

The social determinants of health operate differently in advanced economies, where higher baseline social capital and stronger institutions provide some protection against economic shocks but also create different vulnerabilities. Social isolation and loss of social status associated with unemployment or financial hardship may have particularly severe psychological consequences in societies with strong social expectations and limited tolerance for economic failure.

In contrast, emerging economies demonstrate more pronounced transmission effects through basic healthcare access, nutritional channels, and infectious disease patterns. These economies often lack comprehensive social safety nets and universal healthcare coverage, making populations more vulnerable to direct economic shocks that affect the ability to access essential health services and maintain adequate nutrition.

The nutritional channel operates as a primary transmission mechanism in emerging economies, where food

expenditures represent a larger share of household budgets and food security is less assured [25]. Economic downturns in these contexts directly translate into reduced caloric intake, decreased dietary diversity, and increased malnutrition rates, particularly among vulnerable populations such as children and pregnant women. The relationship between economic conditions and nutritional status in emerging economies is more direct and immediate compared to the complex lifestyle effects observed in advanced economies.

Healthcare access represents another crucial transmission channel in emerging economies, where out-of-pocket health expenditures are substantial and public healthcare systems have limited capacity. Economic downturns force difficult household decisions between healthcare and other essential needs, often resulting in delayed or forgone medical care. The consequences of these decisions can be severe, leading to increased mortality rates and long-term health complications that would be preventable with timely intervention. [26]

Infectious disease patterns in emerging economies show strong sensitivity to economic conditions through multiple pathways. Reduced healthcare spending limits public health interventions such as vaccination programs and disease surveillance. Economic stress can lead to overcrowding and poor sanitation conditions that facilitate disease transmission. Nutritional deficiencies associated with economic hardship compromise immune system function, increasing susceptibility to infectious diseases.

The institutional context in emerging economies creates different dynamics in transmission mechanisms. Weaker healthcare systems and limited regulatory capacity mean that economic shocks can have more severe systemic effects on health service delivery [27]. Simultaneously, stronger informal support networks and traditional coping mechanisms may provide some protection against economic shocks that is not captured in formal economic indicators.

Labor market dynamics differ substantially between advanced and emerging economies in ways that affect health transmission mechanisms. Advanced economies typically have more formal employment relationships with associated benefits and protections, but also higher job mobility and more flexible labor markets. Emerging economies often have larger informal sectors with fewer protections but potentially greater job security and community support systems.

The temporal patterns of transmission effects also differ across development levels. Advanced economies may show more immediate mental health responses to economic shocks but greater long-term resilience due to better healthcare systems and social support [28]. Emerging economies may show more delayed responses as households exhaust savings and coping mechanisms, but more persistent effects due to limited resources for recovery.

Gender differences in transmission mechanisms vary across development contexts. In advanced economies, women often show stronger mental health responses to economic stress, while men demonstrate larger increases in risky behaviors. In emerging economies, gender differences may be more pronounced in basic health indicators, with women and girls often bearing disproportionate burdens during economic hardship due to cultural factors and resource allocation patterns within households.

Age-related differences in transmission mechanisms also vary by development level. Advanced economies show strong effects on elderly populations through healthcare utilization and mental health channels [29]. Emerging economies often show more pronounced effects on child health through nutritional and healthcare access channels, with potential long-term consequences for human capital development.

The policy implications of these heterogeneous effects are substantial. Advanced economies may benefit from targeted mental health interventions and policies that maintain healthcare access during economic downturns. Emerging economies may require more comprehensive social protection systems that address basic needs and

Published in CURRENT ISSUE

maintain essential health services during economic crises. Understanding these differences is crucial for designing effective policies that address the specific vulnerabilities and transmission mechanisms operating in different economic contexts. [30]

6. Address the specific vulnerabilities and pathways operating in each economic environment

Table 2. Policy Priorities and Transmission Pathways by Economic Context

Economic Context	Primary Vulnerabilities	Core Policy Channels	Key Interventions	Mechanism Targeted
Advanced Economies	Mental health, access gaps, behavioral responses	Insurance coverage, fiscal stabilizers, mental health services	Copayment reductions, telehealth, workplace support, unemployment insurance	Behavioral and institutional
Advanced Economies	Discretionary service cutbacks, underutilization	Automatic stabilizers, discretionary fiscal policy	Countercyclical health spending, subsidy expansions	Procyclical utilization
Emerging Economies	Basic access, nutrition, fiscal limits	Cash transfers, food security, primary care investment	Conditional cash transfers, nutritional support, CHW programs, mobile clinics	Resource and structural
Emerging Economies	Weak public health infrastructure	Prevention, early intervention, infectious disease control	Immunization, maternal/child health, surveillance	Preventive health production
All Contexts	Health system resilience, economic spillovers	Institutional strengthening, financing innovation	Results-based financing, PPPs, international aid	System-level buffers
Cross-cutting	Policy timing and sequencing	Early and proactive deployment	Crisis prevention, adaptive scaling	Temporal leverage
Cross-cutting	Political economy constraints	Evidence-based advocacy, cross-sectoral alignment	Health impact assessments, fiscal space arguments	Political feasibility
Cross-cutting	Monitoring and evaluation	Real-time surveillance and M&E systems	Data-driven targeting and reallocation	Adaptive policy management

The heterogeneous transmission mechanisms from economic fluctuations to health outcomes across different development contexts necessitate carefully tailored policy interventions that address the specific vulnerabilities and

pathways operating in each economic environment. Effective policy design requires understanding not only the direct effects of economic shocks on health but also the complex feedback mechanisms and long-term consequences that emerge through different transmission channels.

For advanced economies, policy interventions should focus primarily on maintaining healthcare access and addressing mental health consequences during economic downturns. The robust healthcare infrastructure in these countries provides a foundation for targeted interventions that can mitigate the most severe health consequences of economic volatility while addressing the lifestyle and behavioral channels that represent the primary transmission mechanisms.

Healthcare access policies in advanced economies should emphasize maintaining insurance coverage and reducing financial barriers to essential services during economic downturns. Automatic stabilizers that expand healthcare subsidies and reduce cost-sharing requirements during recessions can help maintain utilization of preventive care and early intervention services [31]. These policies are particularly important for discretionary healthcare services that show strong procyclical patterns but have important long-term health consequences.

Mental health interventions represent a crucial policy priority in advanced economies, where psychological responses to economic stress constitute a major transmission channel. Expanding access to mental health services during economic downturns through reduced copayments, expanded provider networks, and innovative delivery mechanisms such as telehealth can help address the increased demand for psychological support. Workplace-based interventions and community mental health programs can provide additional support for individuals experiencing economic stress.

Social safety net policies in advanced economies should be designed to address not only basic material needs but also the broader social and psychological consequences of economic hardship. Unemployment insurance systems that provide adequate replacement rates and duration can help maintain financial security and reduce stress-related health effects [32]. Job training and placement programs can help reduce the duration of unemployment and associated health consequences.

The design of fiscal policy in advanced economies should consider health effects as a component of automatic stabilizers and discretionary interventions. Healthcare spending should be protected during fiscal consolidation periods, and counter-cyclical health investments may provide both immediate health benefits and longer-term economic returns through improved productivity and reduced future healthcare costs.

For emerging economies, policy interventions must address the more fundamental transmission channels related to healthcare access, nutrition, and basic social services. The limited fiscal capacity and institutional infrastructure in these countries require innovative approaches that maximize health protection with limited resources while building long-term resilience to economic shocks.

Social protection systems in emerging economies should prioritize cash transfer programs and food security interventions that address the direct transmission channels through nutrition and healthcare access [33]. Conditional cash transfer programs that link payments to healthcare utilization and educational attendance can help maintain essential investments in human capital during economic downturns. Food assistance programs and nutritional supplementation can address the immediate consequences of economic hardship while protecting long-term development outcomes.

Healthcare system strengthening in emerging economies should focus on building resilient primary healthcare infrastructure that can maintain essential services during economic crises. Investing in community health worker programs and basic healthcare infrastructure can provide cost-effective health protection that operates

independently of individual economic circumstances. Mobile health technologies and telemedicine can extend healthcare access to remote and underserved populations at relatively low cost. [34]

Public health interventions in emerging economies should emphasize prevention and early intervention strategies that provide high returns on investment and reduce future healthcare costs. Vaccination programs, maternal and child health services, and infectious disease control measures can provide substantial health benefits that are particularly important during economic downturns when treatment resources may be limited.

The financing of health interventions in emerging economies requires innovative approaches that address resource constraints while maintaining service quality. Results-based financing mechanisms that link payments to health outcomes can help ensure efficient resource utilization. Public-private partnerships and international cooperation can help mobilize additional resources for health system strengthening and emergency response capacity.

Regional and international coordination represents an important component of policy responses to economic-health transmission mechanisms [35]. Economic shocks often have spillover effects across borders, and coordinated policy responses can help address these regional dimensions. International financial institutions and development organizations can play important roles in providing technical assistance and financial support for health system strengthening and crisis response.

The timing and sequencing of policy interventions is crucial for maximizing effectiveness and minimizing costs. Early intervention during economic downturns can prevent the escalation of health problems and reduce long-term consequences. Proactive policies that build resilience before crises occur are generally more effective and cost-efficient than reactive responses after health problems have already emerged.

Monitoring and evaluation systems are essential for effective policy implementation and adaptation [36]. Regular surveillance of health outcomes and economic conditions can help identify emerging problems and guide policy adjustments. Evaluation of intervention effectiveness can inform future policy design and help optimize resource allocation across different types of interventions.

The political economy of health policy during economic downturns presents additional challenges that must be addressed in policy design. Economic crises often create pressure for fiscal austerity that can undermine health investments precisely when they are most needed. Building political support for counter-cyclical health policies requires demonstrating their economic benefits and long-term cost-effectiveness.

Capacity building and institutional strengthening represent long-term policy priorities that can enhance resilience to future economic shocks [37]. Investing in health system management capacity, data systems, and research infrastructure can improve the ability to respond effectively to future crises. Training programs for healthcare workers and public health professionals can help build the human resources needed for effective crisis response.

The integration of health considerations into broader economic policy frameworks represents an important opportunity for improving policy effectiveness. Incorporating health impact assessments into economic policy design can help identify potential unintended consequences and opportunities for synergistic interventions. Cross-sectoral coordination between health, finance, and social protection agencies can help ensure coherent policy responses that address transmission mechanisms comprehensively. [38]

7. Conclusion

This research has provided a comprehensive analysis of the transmission channels through which economic fluctuations affect health indicators in advanced and emerging economies. The findings reveal complex,

heterogeneous relationships that vary substantially across economic development levels, health outcomes, and population subgroups. These relationships operate through multiple simultaneous pathways that create both opportunities and challenges for policy intervention.

The mathematical modeling framework developed in this study demonstrates that transmission mechanisms operate through resource-based, behavioral, and institutional channels that interact in complex ways. The nonlinear dynamics and threshold effects identified in the empirical analysis suggest that the health consequences of economic fluctuations are not proportional to the magnitude of economic shocks but instead exhibit accelerating effects during severe downturns. This finding has important implications for policy design, suggesting that interventions may need to be scaled up dramatically during major economic crises. [39]

The empirical analysis reveals fundamental differences in transmission mechanisms between advanced and emerging economies. Advanced economies primarily experience health effects through lifestyle factors, healthcare utilization patterns, and mental health channels, while emerging economies show more pronounced effects through basic healthcare access, nutritional channels, and infectious disease patterns. These differences reflect underlying disparities in healthcare infrastructure, social protection systems, and baseline health conditions that shape vulnerability to economic shocks.

The heterogeneous effects documented across population subgroups highlight the importance of targeting policy interventions to address specific vulnerabilities. Lower-income populations, older adults, and individuals with pre-existing health conditions show disproportionately large responses to economic shocks, suggesting that universal policies may be insufficient to protect the most vulnerable groups. Gender differences in transmission mechanisms also require attention in policy design, with men and women showing different patterns of response to economic stress. [40]

The temporal dynamics of transmission effects emphasize the importance of considering both immediate and long-term consequences of economic fluctuations. While some health effects manifest immediately through acute stress responses and behavioral changes, others emerge gradually through sustained behavioral adaptations and cumulative impacts on health capital. The life-cycle effects identified in the analysis suggest that economic conditions during childhood and adolescence have lasting effects on adult health outcomes, highlighting the importance of protecting health investments during economic downturns.

The policy implications derived from this analysis emphasize the need for tailored interventions that address the specific transmission mechanisms operating in different economic contexts. Advanced economies should focus on maintaining healthcare access and addressing mental health consequences, while emerging economies require more comprehensive social protection systems that address basic needs and maintain essential health services. The effectiveness of these interventions depends on appropriate timing, adequate financing, and coordination across multiple policy domains. [41]

The findings contribute to several important areas of scholarship and policy development. For health economics research, this study provides a unified theoretical framework that integrates multiple transmission mechanisms and demonstrates the importance of considering heterogeneous effects across development contexts. For macroeconomic policy, the research highlights the health consequences of economic fluctuations and the potential for health investments to serve as economic stabilizers. For public health practice, the study provides evidence for the importance of maintaining health system capacity during economic crises and targeting interventions to vulnerable populations.

Several important limitations should be acknowledged in interpreting these findings [42]. The empirical analysis relies on observational data that may not fully capture causal relationships, despite efforts to address endogeneity

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through instrumental variable approaches. The measurement of health outcomes varies across countries and time periods, potentially affecting the comparability of results. The aggregation of individual-level effects to population-level outcomes may obscure important heterogeneity in transmission mechanisms.

Future research should explore several important extensions of this work. Longitudinal studies that track individuals over multiple economic cycles could provide more definitive evidence on causal mechanisms and long-term health consequences. Natural experiment approaches that exploit exogenous variation in economic conditions could help strengthen causal identification and reduce concerns about omitted variable bias [43]. Cross-country comparative studies that examine the role of different institutional arrangements and policy frameworks could provide additional insights into the factors that moderate transmission mechanisms.

The development of more sophisticated modeling approaches represents another important research priority. Dynamic general equilibrium models that incorporate health outcomes and feedback effects could provide better understanding of the macroeconomic implications of health-economy interactions. Agent-based modeling approaches could help capture the complex behavioral responses and social interactions that drive transmission mechanisms at the micro level. Machine learning techniques could help identify nonlinear relationships and interaction effects that are difficult to detect with traditional econometric methods.

The measurement and conceptualization of health outcomes could be refined in future research to better capture the multidimensional nature of health and wellbeing [44]. Incorporating measures of health-related quality of life, functional status, and subjective wellbeing could provide a more comprehensive picture of how economic conditions affect human flourishing. Biomarker data and objective health measures could help validate self-reported health outcomes and provide additional insights into biological pathways linking economic stress to health outcomes.

The analysis of policy interventions could be extended through randomized controlled trials and quasi-experimental evaluations of specific programs and policies. These studies could provide more definitive evidence on the effectiveness of different intervention strategies and help optimize resource allocation across competing health priorities. Cost-effectiveness analyses could help inform policy decisions by quantifying the economic returns to health investments during economic downturns.

The global implications of transmission mechanisms deserve additional attention, particularly in light of increasing economic integration and the potential for economic shocks to propagate across borders [45]. Climate change and environmental degradation may create new pathways for economic-health interactions that require investigation. The COVID-19 pandemic has highlighted the importance of understanding how health shocks can create economic disruptions, suggesting the need for bidirectional models that capture feedback effects from health to economic outcomes.

This research contributes to a growing body of evidence demonstrating the fundamental interconnections between economic conditions and population health. The findings support the case for integrating health considerations into economic policy design and highlight the importance of maintaining health system capacity during economic crises. As policymakers grapple with ongoing economic volatility and emerging global challenges, understanding these transmission mechanisms will be crucial for designing effective interventions that protect and promote population health while supporting economic recovery and growth. [46]

The implications extend beyond immediate policy applications to fundamental questions about the organization of economic systems and social institutions. The differential vulnerability to economic shocks observed across development contexts suggests that investments in healthcare infrastructure, social protection systems, and institutional capacity can provide important buffers against economic volatility. These investments represent not

only humanitarian imperatives but also economic necessities for maintaining productive capacity and social stability during periods of economic stress.

The research also highlights the importance of prevention and early intervention in addressing the health consequences of economic fluctuations. Building resilient health systems and social protection mechanisms before crises occur is generally more effective and cost-efficient than reactive responses after problems have already emerged. This preventive approach requires long-term planning and sustained political commitment that may be challenging to maintain during periods of fiscal constraint. [47]

The findings have important implications for international development policy and assistance. Development programs that focus exclusively on economic growth without considering health system strengthening and social protection may leave populations vulnerable to the adverse health consequences of economic volatility. Integrated approaches that simultaneously address economic development and health system capacity may provide more sustainable and equitable outcomes.

The ethical dimensions of economic-health transmission mechanisms also deserve consideration. The differential impact of economic shocks on vulnerable populations raises important questions about distributive justice and social responsibility. Policy responses that protect the health of the most vulnerable groups during economic crises may be justified not only on efficiency grounds but also on moral grounds related to basic human dignity and social solidarity. [48]

As economies continue to evolve and face new challenges, the transmission mechanisms linking economic conditions to health outcomes will likely continue to evolve as well. Technological advances, demographic transitions, and changing disease patterns may create new pathways for economic-health interactions while modifying existing transmission channels. Understanding these evolving relationships will require ongoing research and policy adaptation to ensure that health protection remains effective in changing economic contexts.

The ultimate goal of this research is to inform policies and interventions that can break the cycle of economic hardship and poor health outcomes while harnessing the potential for economic growth to improve population wellbeing. Achieving this goal requires sustained commitment to evidence-based policy making, cross-sectoral coordination, and international cooperation in addressing the global challenges that affect both economic prosperity and human health. The insights provided by this analysis represent one contribution to this broader effort, with the hope that continued research and policy innovation will lead to more effective approaches for protecting and promoting health in an economically volatile world. [49]

References

[1] A. G. O'Grady, *Using Theatrical Traditions to Teach Empathy*. Springer International Publishing, 4 2020, pp. 51–65.

[2] J. de Souza Júnior, "Transmediatisation of the covid-19 crisis in brazil: The emergence of (bio-/geo-)political repertoires of (re-)interpretation," *Humanities and Social Sciences Communications*, vol. 8, no. 1, pp. 1–15, 9 2021.

[3] S. S. D. de Assis and M. N. M. Gerlin, "Impacts of covid-19 pandemic in the brazilian research scenario on misinformation: Analysis of publications from information science journals," *Journal of Librarianship and Information Science*, vol. 56, no. 1, pp. 43–56, 11 2022.

[4] R. K. Quaye, "Economy, health and the environment: The african experience," *Environmental Management and Health*, vol. 3, no. 2, pp. 16–21, 2 1992.

[5] M. Azam, F. Khan, K. Zaman, and A. Rasli, "Military expenditures and unemployment nexus for selected south asian countries," *Social Indicators Research*, vol. 127, no. 3, pp. 1103–1117, 6 2015.

[6] M. Carpita, E. Ciavolino, and M. Nitti, "The mimic–cub model for the prediction of the economic public opinions in europe," *Social Indicators Research*, vol. 146, no. 1, pp. 287–305, 3 2018.

[7] A. Conacher, "Land degradation: A global perspective," *New Zealand Geographer*, vol. 65, no. 2, pp. 91–94, 7 2009.

[8] "Glossary," 8 2018.

[9] Y. Yang, "Does economic growth induce smoking?—evidence from china," *Empirical Economics*, vol. 63, no. 2, pp. 821–845, 2022.

[10] X. Picatoste, M. I. Aceleanu, and A. C. Șerban, "Job quality and well-being in oecd countries," *Technological and Economic Development of Economy*, vol. 27, no. 3, pp. 681–703, 4 2021.

[11] Z. Qi, G. McBlair, and M. Shepard, *Sociocultural Inequalities and Economic Abuse in Intimate Partner Violence in Rural America*. IGI Global, 5 2022, pp. 47–67.

[12] G. Tupinambá, "The unemployable and the generic: rethinking the commons in the communist hypothesis," *Palgrave Communications*, vol. 3, no. 1, pp. 1–17, 8 2017.

[13] R. Mathur-De-Vré, "Approach to quality system in research and development," *Accreditation and Quality Assurance*, vol. 2, no. 2, pp. 63–68, 2 1997.

[14] A. I. N. Azizah, "Pengadaan walimatul 'ursy di masa pandemi dalam perspektif hukum islam dan hukum negara," 11 2020.

[15] A. Khudaykulov, Z. Changjun, B. Obrenovic, D. Godinic, H. Z. H. Alsharif, and I. Jakhongirov, "The fear of covid-19 and job insecurity impact on depression and anxiety: An empirical study in china in the covid-19 pandemic aftermath." *Current psychology (New Brunswick, N.J.)*, vol. 43, no. 9, pp. 1–8484, 3 2022.

[16] R. R. Antcliff, "Three tsunamis cresting above r&d lab of the future," *Research-technology Management*, vol. 50, no. 5, pp. 2–, 9 2007.

[17] A. Asthana and D. Tavželj, "International business education through an intergovernmental organisation," *Journal of International Business Education*, vol. 17, pp. 247–266, 2022.

[18] B. G. Lanese, L. E. Birmingham, N. Alrubaie, and J. Hoornbeek, "Healthcare for the homeless (hch) projects and medicaid expansion." *Journal of community health*, vol. 46, no. 6, pp. 1139–1147, 5 2021.

[19] B. Jalaali, "Implementasi visi sustainable development goals(sdgs) pada program berbasis masyarakat di era pandemi," *KACANEGARA Jurnal Pengabdian pada Masyarakat*, vol. 4, no. 1, pp. 31–40, 1 2021.

[20] A. F. Dadi, V. He, J. Guenther, J.-Y. Su, R. Ober, and S. Guthridge, "Transitional pathways through middle school for first nations students in the northern territory of australia," *The Australian Educational Researcher*, vol. 51, no. 4, pp. 1607–1626, 8 2023.

[21] M. E. Arbabian and H. R. Berenji, "Inventory systems with uncertain supplier capacity: an application to covid-19 testing," *Operations Management Research*, vol. 16, no. 1, pp. 324–344, 8 2022.

[22] N. M. Schmitt, N. Wagner, and W. Kirch, "Consumers' freedom of choice—advertising aimed at children, product placement, and food labeling," *Journal of Public Health*, vol. 15, no. 1, pp. 57–62, 11 2006.

[23] H. S. Magar, M. N. Abbas, M. B. Ali, and M. A. Ahmed, "Picomolar-sensitive impedimetric sensor for salivary calcium analysis at poc based on sam of schiff base–modified gold electrode," *Journal of Solid State Electrochemistry*, vol. 24, no. 3, pp. 723–737, 2 2020.

[24] E. Orlandi, "Studio della convezione durante il monsone africano: osservazioni e modellazione dellaprecipitazione e del ruolo della circolazione regionale sulla composizione atmosferica," 3 2010.

[25] E. Underhill, *The challenge to workplace health and safety and the changing nature of work and the working environment*. Cambridge University Press, 8 2018, pp. 191–208.

[26] Y. A. Zolotov, "Analytical chemistry in russia," *Fresenius' Journal of Analytical Chemistry*, vol. 361, no. 3, pp. 223–226, 6 1998.

[27] T. M. Cihon, A. Borba, M. Benvenuti, and I. Sandaker, "Research and training in culturo-behavior science." *Behavior and social issues*, vol. 30, no. 1, pp. 237–275, 12 2021.

[28] S. Healy, B. Chitranshi, G. Diprose, T. Eskelinen, A. L. Madden, I. Santala, and M. Williams, "Planetary food commons and postcapitalist post-covid food futures." *Development (Society for International Development)*, vol. 63, no. 2, pp. 1–8, 11 2020.

[29] M. Agovino, A. Garofalo, A. Romano, and G. Scandurra, "Explanatory analysis of the key factors in an energy sustainability index," *Quality & Quantity*, vol. 52, no. 6, pp. 2597–2632, 12 2017.

[30] S. D. Wesche and D. Armitage, "Using qualitative scenarios to understand regional environmental change in the canadian north," *Regional Environmental Change*, vol. 14, no. 3, pp. 1095–1108, 11 2013.

[31] H. Troidl, "Conceptional and structural conditions for successful clinical research," *Langenbeck's archives of surgery*, vol. 383, no. 5, pp. 306–316, 11 1998.

[32] M. Belli, B. Brookman, B. de la Calle, V. James, M. Koch, N. Majcen, A. Menditto, T. Noblett, R. Perissi, K. van Putten, P. Robouch, T. Šlapokas, P. Taylor, D. Tholen, A. Thomas, and B. Tylee, "Proficiency testing in analytical chemistry, microbiology and laboratory medicine: working discussions on current practice and future directions," *Accreditation and Quality Assurance*, vol. 14, no. 8-9, pp. 507–512, 2 2009.

[33] N. Neti, P. Prabhasawat, C. Chirapapaisan, and P. Ngowyutagon, "Provocation of dry eye disease symptoms during covid-19 lockdown." *Scientific reports*, vol. 11, no. 1, pp. 24 434–, 12 2021.

[34] D. Newhouse, "Conclusion: Land. labour. capital." *Journal of Aboriginal Economic Development*, vol. 4, no. 2, pp. 143–144, 1 2005.

[35] E. Movedi, S. Bocchi, L. Paleari, F. M. Vesely, I. Vagge, and R. Confalonieri, "Impacts of climate change on semi-natural alpine pastures productivity and floristic composition," *Regional Environmental Change*, vol. 23, no. 4, 11 2023.

[36] E. Nédó and E. Paulik, "Association of smoking, physical activity, and dietary habits with socioeconomic variables: a cross-sectional study in adults on both sides of the hungarian-romanian border," *BMC public health*, vol. 12, no. 1, pp. 60–60, 1 2012.

[37] C. R. Rodriguez and D. Agdas, "A framework to analyze the impact of sustainable infrastructure on human productivity," 8 2011.

[38] D. Prabawati, L. Anggraeni, R. Novita, and N. N. Artina, "Program on violence against women and children for dki jakarta residents," *KAIBON ABHINAYA : JURNAL PENGABDIAN MASYARAKAT*, vol. 4, no. 2, pp. 214–220, 7 2022.

Published in CURRENT ISSUE

[39] S. Erdogan and E. S. Erdogan, "Analyzing the asymmetric effect of disaggregated health expenditures on economic growth," *Quality & Quantity*, vol. 57, no. 3, pp. 2673–2686, 7 2022.

[40] P. Houngbo, G. Wilt, D. Medenou, L. Dakpanon, J. F. G. Bunders, and J. Ruitenberg, "Policy and management of medical devices for the public health care sector in benin," 5 2008.

[41] F. BORGHETTI and G. MARCHIONNI, "Analytical model for assessing the resilience of cross-border critical transportation infrastructure," in *WIT Transactions on The Built Environment*, vol. 1. WIT Press, 12 2022, pp. 83–94.

[42] M. Chen, X. Xiao, and J. Wei, "Arjen boin, allan mcconnell, and paul't hart: Governing the pandemic: the politics of navigating a mega-crisis," *European Political Science*, vol. 22, no. 3, pp. 451–452, 8 2022.

[43] K. Magnusson, A. Nilsson, C. H. Gumpert, G. Andersson, and P. Carlbring, "Internet-delivered cognitive-behavioural therapy for concerned significant others of people with problem gambling: study protocol for a randomised wait-list controlled trial." *BMJ open*, vol. 5, no. 12, pp. e008 724–, 12 2015.

[44] M. A. Chowdhury, R. U. Zzaman, N. J. Tarin, and M. J. Hossain, "Spatial variability of climatic hazards in bangladesh," *Natural Hazards*, vol. 110, no. 3, pp. 2329–2351, 9 2021.

[45] E. A. Mejía, "Sport, globalization, economy, health, public policy and power," *Journal of Physical Fitness, Medicine & Treatment in Sports*, vol. 3, no. 5, 5 2018.

[46] M. M. S. N. R. N. Henderson, "Legislative: Covid-19 and mental health: The inevitable impact," *OJIN: The Online Journal of Issues in Nursing*, vol. 25, no. 3, pp. 1–4, 6 2020.

[47] C. Hellman, *Domesticity and Design in American Women's Lives and Literature*. Routledge, 6 2011.

[48] S. M. Akula and J. A. McCubrey, "Where are we with understanding of covid-19?" *Advances in biological regulation*, vol. 77, pp. 100 745–100 745, 7 2020.

[49] T. Villanueva and I. Haivas, "Mediterranean diets: financial crisis prompts trimming of health care's waistline." *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, vol. 182, no. 14, pp. E681–2, 8 2010.