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Public management in the COVID-19 pandemic: safeguarding the rights and well-being of vulnerable groups

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The COVID-19 pandemic has not only overwhelmed public health systems but also exacerbated social inequalities. While existing research has documented various forms of inequalities exposed by the crisis, there remains a lack of a comprehensive account of the broad plights faced by vulnerable groups. Moreover, few studies have systematically examined the practices that promote their rights and well-being through a public management lens. This study adopts a scoping review methodology guided by the PRISMA-ScR framework, analyzing 429 high-quality publications (2020–2025) to address this gap. The results reveal a three-phase evolution of research on the topic: problem identification, mechanism investigation, and a future-oriented focus. Key themes center on inequalities and plights across health, economy, education, and social participation. Notably, research output remains geographically imbalanced—regions most affected by COVID-19 are the most studied rather than the most active in contributing research. Our analysis underscores the intersecting nature of plights faced by vulnerable groups and compares cross-national experiences in safeguarding their rights and well-being. We conclude by proposing a more integrated theoretical framework for understanding vulnerability and identifying strategies to enhance public-sector efforts in protecting vulnerable groups during crises.

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Introduction

At the end of 2019, the COVID-19 pandemic rapidly evolved into a global crisis, posing a significant threat to global public health (Walker et al., 2020; Rosis et al., 2023). To contain the spread of the virus, countries worldwide implemented stringent measures such as lockdowns, quarantines, and business closures (Chu et al., 2020). Although vital for protecting public health, these interventions also had profound impacts on socioeconomic operations and public welfare. It is estimated that the pandemic has driven 100 million people into extreme poverty, led to unemployment surges across countries, disrupted education, strained medical resources, and exacerbated social inequalities (Zhao and Rasoulinezhad, 2023). Among those most severely affected were vulnerable groups, who faced compounded risks and systemic disadvantages due to pre-existing social, economic, and health inequities (Frohlich and Potvin, 2008; Patel et al., 2020). Therefore, this study examines the plights and inequities confronting these groups during the COVID-19 pandemic and explores strategies to safeguard their rights and well-being.

Vulnerable groups refer to populations that are more susceptible to harm, discrimination, or disadvantage due to various factors such as social, economic, geographic, or physical conditions. These groups include women, the elderly, children, refugees, HIV/AIDS patients, and ethnic minorities (Patel et al., 2020; United Nations, 2015). According to the World Health Organization, vulnerable groups are more likely to be affected by disasters due to characteristics such as age, gender and sexual orientation, race, culture, religion, disability, socioeconomic status, geographic location, or migration status (WHO, 2022).

The pandemic deepened social inequalities. The International Labor Organization highlights that the disruption to the labor market caused by the pandemic has had a disproportionately greater impact on women than men. Globally, women's employment loss stood at 5%, compared to 3.9% for men. Notably, women were more likely than men to exit the labor market and became inactive (ILO, 2021). During the pandemic, Black adults were more than three times as likely as Whites to report food insecurity, job loss, or unemployment, while residents without a college degree were twice as likely to report food insecurity compared to college graduates. Additionally, young adults and women were more likely to report economic plight (Coats et al., 2022). In terms of education, global school closures (Alban Conto et al., 2021) and decreased household expenditures (Khan and Ahmed, 2021) resulted in millions of children dropping out of school. Moreover, individuals with disabilities and the elderly faced increased risks of inadequate care and psychological distress during isolation. Research indicates that older adults had a higher risk of infection and mortality during the pandemic, and were more prone to fear, stress, depression, loneliness, and mental health issues (Ganesan et al., 2021; Giancotti et al., 2021). Stigma disproportionately affects women, youth, low-income populations, and racially or gender-marginalized communities (Gibson et al., 2021; Green et al., 2021), intensifying the multifaceted disadvantages experienced by vulnerable groups in health, employment, and education. Although a growing body of literature has documented the disproportionate impact of COVID-19 on vulnerable groups, most studies remain fragmented across specific disadvantages and isolated national contexts. Accordingly, *the first research gap* we identified is a lack of a comprehensive, systematic review that synthesizes the multifaceted plights faced by vulnerable groups during the pandemic.

From a public management perspective, the COVID-19 crisis exposed not only epidemiological risks but also systemic weaknesses in governance, social protection, and public service delivery. It brought into sharp focus long-standing deficiencies, including insufficient public health emergency capacity, gaps in social safety net coverage, and unequal access to public services (Cook and Ulriksen, 2021; Tulenko and Vervoort, 2020). Meanwhile, although pandemic control measures were epidemiologically necessary, they disproportionately restricted the livelihoods, mobility, and social connections of vulnerable groups, highlighting the fundamental governance dilemma of balancing infection control with social justice (Lazarus et al., 2020). While studies have explored these weaknesses, there has been insufficient effort to identify and compare cross-national public management practices aimed at safeguarding vulnerable groups. *Thus, the second research gap* is the absence of a systematic analysis of cross-national management strategies designed to protect vulnerable groups and enhance their rights and well-being during the pandemic.

To address these gaps, this study conducts a systematic scoping review of global research published between 2020 and 2025. *It aims to answer the following questions:* **(1)** What are the key themes, evolution of research frontiers, and research output distribution in studies on protecting vulnerable groups during the pandemic? **(2)** How has COVID-19 exacerbated the inequalities experienced by the vulnerable groups? **(3)** What public management measures have different countries adopted to protect vulnerable groups, and how do these approaches compare?

This study makes three key contributions. First, it represents one of the first systematic reviews of research examining the inequitable plight of vulnerable groups and corresponding protection measures in the context of the pandemic. Second, by adopting intersectionality as a heuristic lens, it uncovers the complex and intertwined causal relationships across different dimensions of plights, thereby extending social vulnerability theory (Cutter et al., 2003). Third, it systematically synthesizes the strengths and limitations of existing public sector protections for vulnerable groups and distills common principles underpinning successful practices.

Methodology

Following the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) guidelines (Tricco et al., 2018), we conducted a structured search of the Web of Science Core Collection and Scopus database, yielding 429 high-quality publications. These articles were then analyzed using a mixed-methods approach combining bibliometric analysis (CiteSpace 6.4.R3) and thematic coding (Cohen's Kappa = 0.9). This process allowed us to identify key research trends, pinpoint key themes, and analyze the challenges and policy responses concerning vulnerable populations.

Literature search strategy. A systematic search was conducted in the Web of Science (WoS) Core Collection and Scopus database, selected for its authoritative coverage of the social sciences and provision of standardized metadata suitable for bibliometric analysis (Pranckutė, 2021). Moreover, these databases collectively cover 100 journals closely related to public management, such as Public Management Review, Public Administration Review. The search strategy combined three sets of keywords using Boolean operators: (1) pandemic-related terms (e.g., "COVID-19" OR "Coronavirus" OR "2019-nCoV" OR "SARS-CoV-2" OR "Pandemic"), (2) public management terms (e.g., "Public Administration" OR "Public Management" OR "Public Policy" OR "Public Sector" OR "Public Service" OR "Crisis Management" OR "Emergency Response"), and (3) vulnerable group terms (e.g., "Vulnerable Populations" OR "Vulnerable Groups" OR "Disadvantaged Populations" OR "Disadvantaged Groups" OR

"Marginalized Populations" OR "Marginalized Groups" OR "At-risk Populations" OR "At-risk Groups" OR "Equity" OR "Equality" OR "Disparity" OR "Poverty" OR "Unemployment" OR "Education Inequality"). The search was restricted to literature published between January 1, 2020, and September 30, 2025, yielding an initial result of 511 publications. This timeframe was selected to encompass the entire course of the COVID-19 pandemic—from its initial global emergence to the period immediately preceding the finalization of this review.

It should be noted that systematic reviews, including the most recent publication years may be affected by factors such as publication lag and indexing delays in databases. Consequently, although our search strategy aimed to be comprehensive, it might not have captured all academic outputs from 2025. Thus, the inclusion of 2025 publications is intended to identify emerging themes and early trends within the evolving research landscape, rather than to provide a complete and comprehensive representation of the literature from that year.

Eligibility criteria. Studies were included if they: (1) focused on the pandemic's impact on vulnerable groups and/or public policy responses; (2) adopted a public management analytical perspective; (3) were peer-reviewed empirical research (quantitative, qualitative, or mixed-methods), theoretical analyses, policy evaluations, or systematic reviews; and (4) were published in English. Studies were excluded if they: (1) were purely clinical or biomedical in nature; (2) focused solely on enterprise or non-profit management without a public sector perspective; (3) were non-academic publications; (4) lacked accessible full text; or (5) had been retracted.

The phrase "public management analytical perspective" allows for interpretive variability. To ensure objectivity, transparency, and reproducibility in the literature screening process, we implemented two specific measures in our study to transform this conceptual criterion into operable and verifiable indicators. First, we established a clear operational definition of a "public management analytical perspective." During the screening phase, inclusion was not based on subjective interpretation but required that studies meet at least one of the following specific criteria. a) Analysis centered on public sector actions: the study explicitly examines the decisions, policy formulation, implementation, or coordination roles of government bodies or public sectors. b) Focus on public governance: the study investigates typical public governance instruments such as social protection systems, public service delivery (e.g., healthcare, education), regulatory frameworks, or cross-sector collaboration. c) Use of public management theories: The literature explicitly employs classical theories or concepts from the field of public management—such as governance networks, policy process, multiple streams framework or New Public Management—as the foundation for its analysis. Additionally, we ensured consistency through independent screening and cross-verification by multiple researchers. Two researchers independently applied the above operational definitions during screening. In cases of disagreement, a structured discussion was held, and consensus was reached by referring to authoritative definitions in the field. This procedure minimized bias arising from individual subjective interpretations.

Screening process. The study selection process followed the PRISMA-ScR flow diagram (Fig. 1). The 511 records identified were first screened by two researchers with backgrounds in public management based on titles and abstracts. Discrepancies were resolved through structured discussion or consultation with a senior researcher. This stage excluded 71 irrelevant records, leaving 439 for full-text assessment. During the full-text review, the researchers independently assessed study design, methodology, data reliability, and consistency of evidence. Ten studies were excluded due to inaccessible full texts ($n = 2$), major design flaws ($n = 3$), lack of a public management perspective ($n = 4$), or retraction ($n = 1$), resulting in 429 studies for final inclusion. To ensure coding reliability, the researchers independently coded a random sample of 50 articles (11.7%). The inter-coder agreement, measured by Cohen's Kappa, was 0.82 initially and improved to 0.9 after refinement of the coding manual (Landis and Koch, 1977). Therefore, the coding framework and results can be considered to demonstrate high reliability.

Data extraction and thematic coding. We used a standardized form to extract information on (1) bibliographic information, (2) study characteristics (e.g., types of vulnerable groups, dimensions of impact, policy responses, theoretical frameworks, and methodologies), and (3) key findings and policy recommendations. The two researchers performed data extraction independently, with a random 10% of the samples cross-verified for consistency. We then performed thematic analysis combining deductive and inductive approaches (Braun and Clarke, 2006). The deductive framework, based on UN Sustainable Development Goals and WHO classifications, pre-defined four primary types of codes: health, economy, education, and social participation. Inductive open coding was then applied to identify specific manifestations, underlying mechanisms, and policy interventions.

Bibliometric analysis. A bibliometric analysis was performed using CiteSpace (version 6.4.R3) (Chen, 2006) on the 429 included articles to visualize the intellectual structure and dynamics of the research field. The analysis focused on three dimensions (see Section "Results" for details): (1) key research themes, identified through keyword co-occurrence network mapping; (2) the evolution of research frontiers, delineated through keyword burst detection using the Kleinberg algorithm; and (3) the global distribution of research efforts, examined via institutional analysis. The CiteSpace parameters were set as follows: one-year time slices, node types for keywords and institutions, Pathfinder network pruning, and cosine similarity coefficient.

Results

Mapping the evolution of research: bibliometric analysis

Research themes. The keyword co-occurrence network analysis reveals the core research themes and their interconnections in studies on vulnerable group protection during the pandemic (Fig. 2). In the network visualization, node size corresponds to keyword frequency, line thickness indicates co-occurrence strength, and coloration denotes publication year.

The analysis identifies "public policy" and "COVID-19 pandemic" as central nodes in the network, with degree centrality scores reaching 0.42 and 0.38, respectively, indicating their pivotal role in connecting diverse research conversations. "Crisis management" and "impact" function as bridging nodes, with betweenness centrality scores of 0.28 and 0.24, respectively, underscoring the pivotal role of crisis governance in integrating research on multidimensional adversities. The robust co-occurrence link between "health equity" and "social equity" (co-occurrence strength: 12.7) suggests that researchers should recognize the profound interconnection between health inequalities and social disparities. Around these core nodes, the network organizes into four distinct thematic clusters representing the primary areas of research focus: health, economy, education, and social participation.

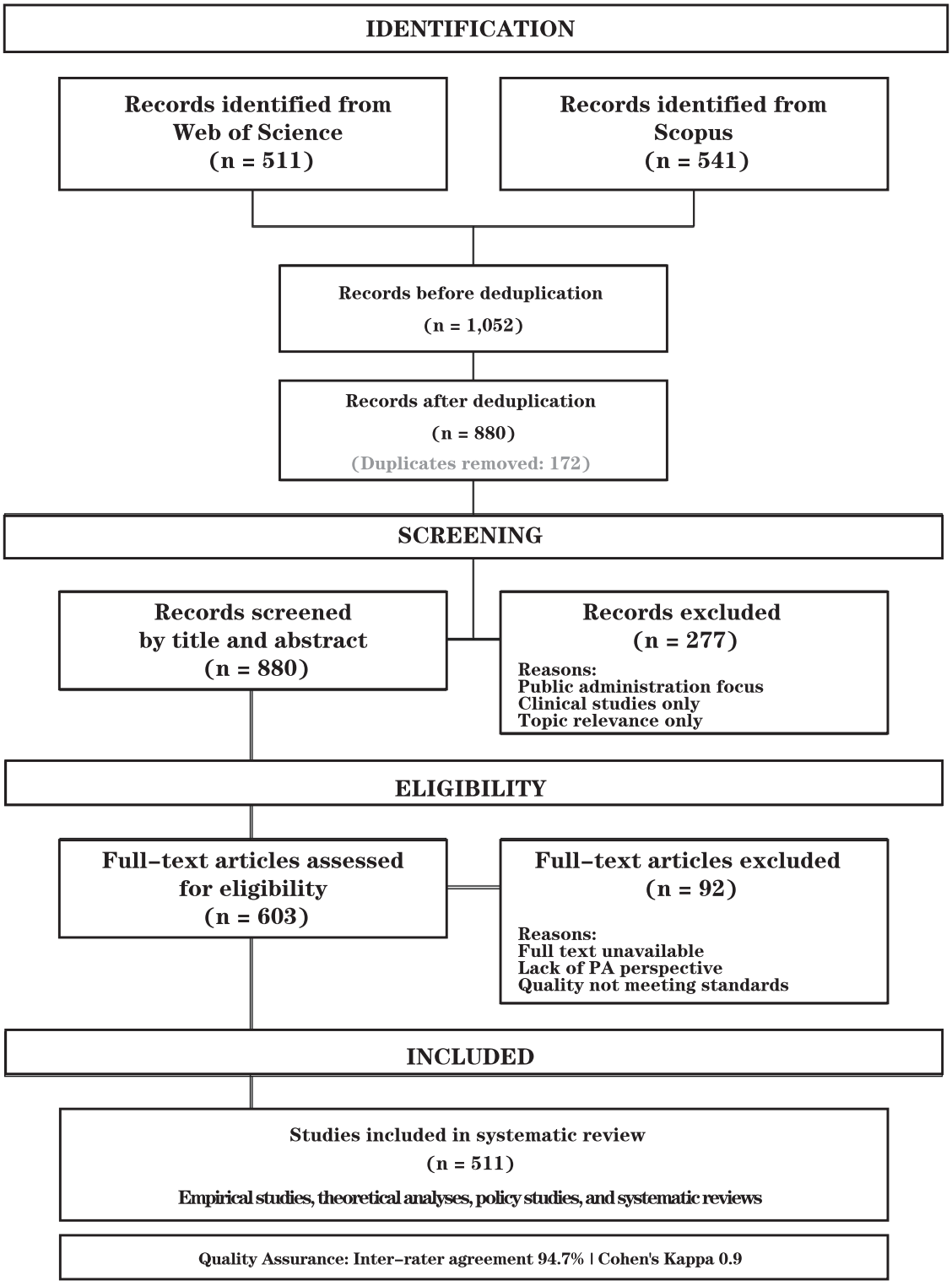

Fig. 1 PRISMA-ScR flow diagram illustrating the systematic literature selection process.

The evolution of research frontiers. Keyword burst detection analysis identifies the emerging research topics that experienced a sharp increase in citation frequency during 2020–2025 (Fig. 3). In the resulting visualization, red segments denote periods of high citation activity (bursts), while blue segments represent baseline periods. The "Strength" value quantifies the intensity of each burst, reflecting the extent of a citation surge regarding a given topic within a specific timeframe. The analysis reveals three distinct phases in the evolution of research frontiers.

Phase 1 (2020–2021): problem identification: The initial phase featured terms such as "vulnerable populations" (Strength 2.49) and "social equity" (2.35) from 2020, indicating a research focus on identifying at-risk groups and assessing inequities. A subsequent shift towards policy responses was marked by bursts in "public policy" (1.86), "poverty" (2.39), "work" (1.99), and "emergency response" (1.88) from 2020 to 2021. Research during this period was predominantly descriptive and exploratory, seeking to answer fundamental questions about

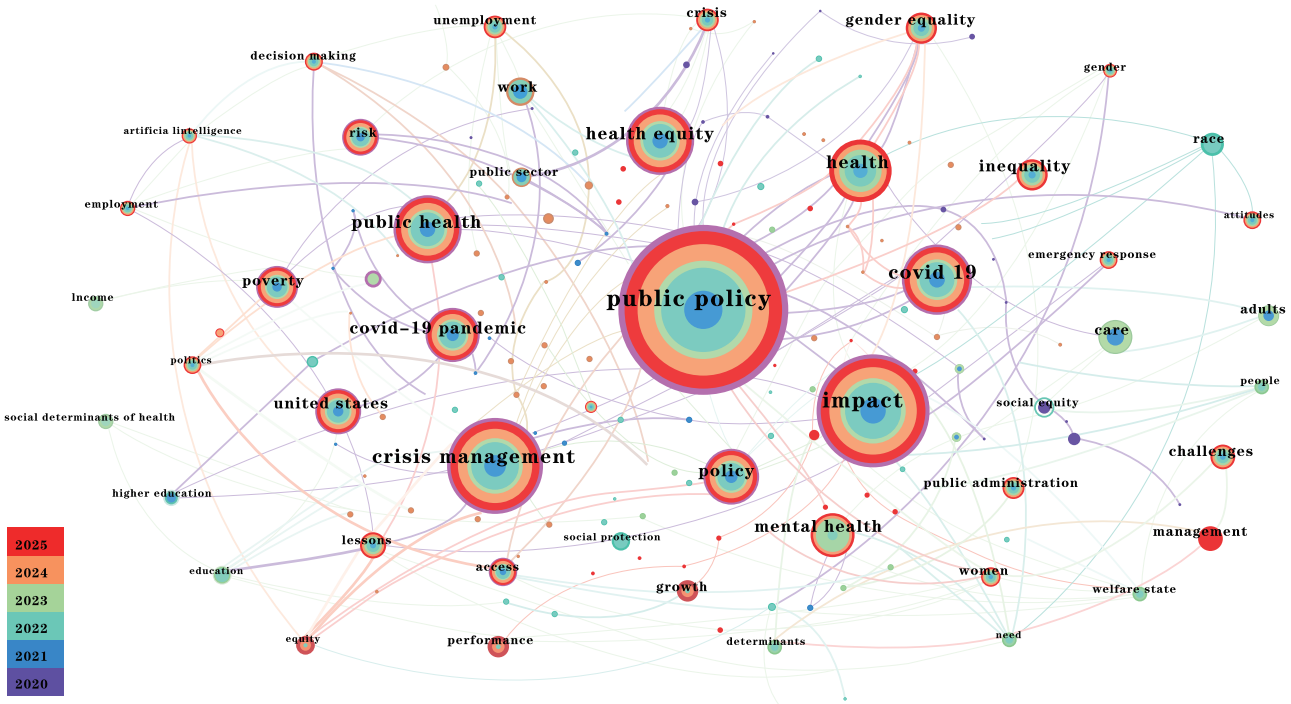

Fig. 2 Keyword co-occurrence network map.

Topics	Year	Strength	Begin	End	2020–2025
vulnerable populations	2020	2.49	2020	2020	
social equity	2020	2.35	2020	2020	
public policy	2020	1.86	2020	2021	
poverty	2021	2.39	2021	2021	
work	2021	1.99	2021	2021	
emergency response	2021	1.88	2021	2021	
race	2022	3.12	2022	2022	
social protection	2022	2.22	2022	2022	
strategy	2022	1.77	2022	2022	
adults	2022	1.64	2022	2023	
mental health	2022	2.46	2023	2023	
determinants	2023	2.44	2023	2023	
care	2020	1.68	2023	2023	
entrepreneurship	2024	1.58	2024	2025	
labor market	2024	1.58	2024	2025	

Fig. 3 Topics with the strongest citation bursts.

which groups were most vulnerable and how their vulnerabilities manifested.

Phase 2 (2022–2023): mechanism investigation: The research focus deepened in the second phase, moving from describing problems to analyzing underlying causes. The emergence of keywords like "race" (3.12), "social protection" (2.22), and "strategy" (1.77) in 2022 signifies an examination of how structural factors shape vulnerability and a critical evaluation of social protection systems. Bursts in "mental health" (2.46) and "determinants" (2.44) during 2022–2023 reveal a broadening perspective to include long-term psychological impacts and theoretical analyses of social determinants. The burst of "adults" (1.64) in 2022 further suggests an expansion of research attention beyond traditional vulnerable groups (e.g., children and the elderly) to include working-age adults in precarious employment.

Phase 3 (2024–2025): future-oriented focus: The most recent phase shows an extension of the research agenda towards post-pandemic recovery. Keyword bursts in "entrepreneurship" (1.58) and "labor market" (1.58) in 2024 signal a growing interest in long-term economic impacts and employment restructuring. However, their relatively low burst strength and short duration suggest these are nascent research frontiers, where scholarly depth and breadth are still developing.

A temporal analysis of keywords further illustrates the dynamic trajectories of research themes (Fig. 4). The timeline view shows that the field initially centered on core terms like "public policy," "public health," and "COVID-19 pandemic" in 2020, before branching into themes such as "crisis management," "poverty," and "health equity" in 2021. From 2022 onward, the research further diversified into topics, including "mental health," "gender equality," and "race". The keyword "impact" persisted throughout the entire period, reflecting sustained attention to assessing the pandemic's effects. Notably, "policy" exhibited two distinct burst peaks between 2021 and 2023, corresponding first to the intensive formulation of pandemic response measures and later to the phase of policy evaluation.

The thematic cluster timeline map (Fig. 5) visualizes the shifting research focus across nine major topic clusters. For instance, Cluster #0 ("disparity") evolved from emphasizing "social support" and "employment" in 2020 to "prevalence" and "neoliberalism" in 2022, and ultimately to "governance" in 2024—reflecting a theoretical progression from emergency response to structural critique and future-oriented governance. The concentrated emergence of Cluster #1 ("text analysis") during 2021–2022 corresponds to a period of methodological innovation within the field. Cluster #5 ("public policy") exhibits the most continuous and dense timeline, confirming public policy as the enduring core of this research domain.

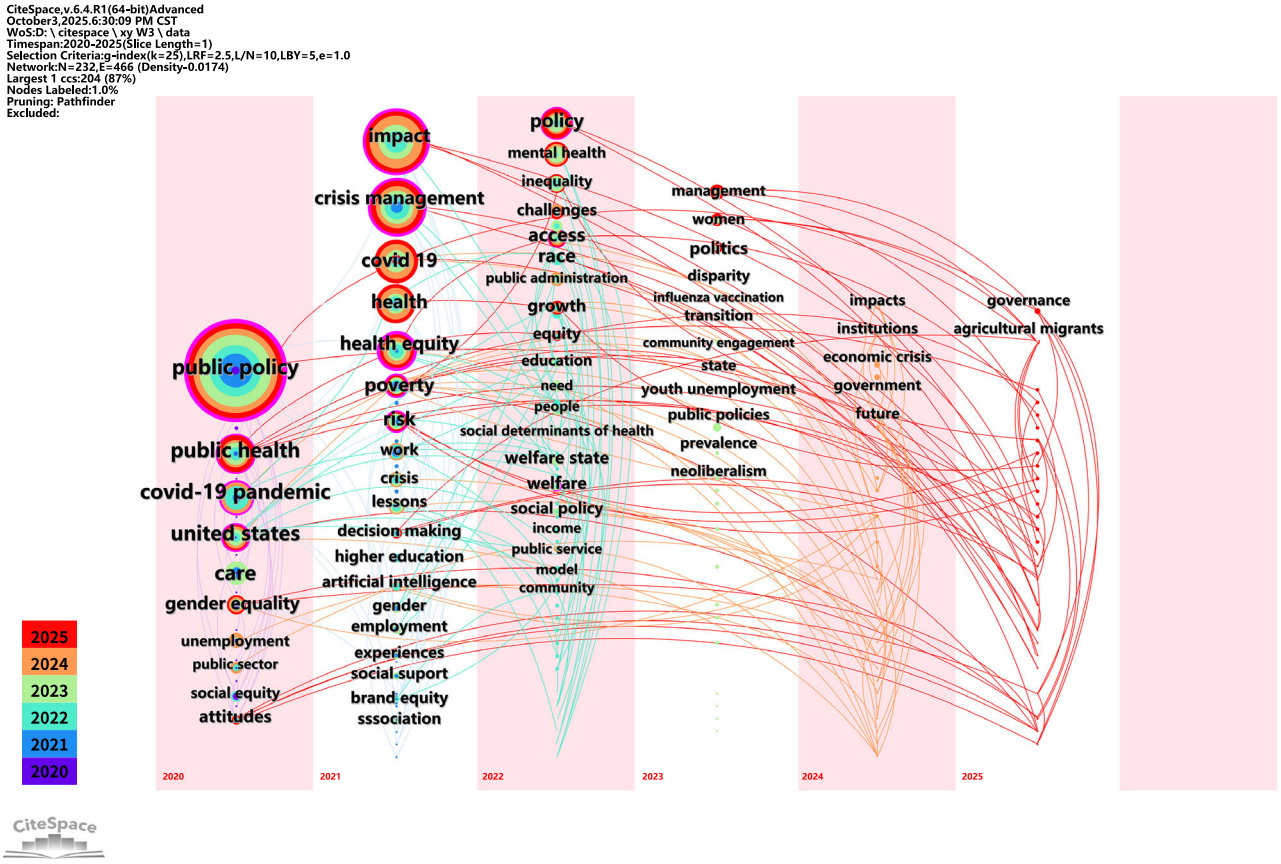

Fig. 4 Temporal evolution of keywords: a Sankey diagram. Note: The diagram visualizes the thematic flow of keywords from 2020 to 2025, with node sizes representing their annual frequency.

Global distribution of research output. An analysis of country/region collaboration networks reveals the global research landscape concerning the protection of vulnerable groups during the COVID pandemic (Fig. 6). The United States occupies the central position in the network, with the highest degree centrality score (0.56), and serves as the primary hub, maintaining collaborative ties with 43 countries/regions. The UK (0.34), China (0.28), Australia (0.24), and Canada (0.22) form a secondary tier of influential actors. Together, these five countries account for 68.3% of all collaborative links in the network, establishing a dominant research structure centered around the United States with support from the UK, China, Australia, and Canada.

The global distribution of research output is markedly uneven. Developed nations—including the United States, the United Kingdom, Canada, Australia, Germany, and France—contribute the majority of publications. This geographical imbalance in knowledge production carries significant epistemological implications: most research on vulnerable groups in the Global South is produced by scholars from the Global North, potentially resulting in studies *about*—rather than *by* or *with*—these populations and thereby marginalizing local perspectives. Sub-Saharan African countries are nearly entirely absent from the research network, while Latin America is sparsely represented, with only Brazil, Chile, Colombia, and Mexico appearing as minor nodes with minimal centrality. This pattern presents a stark contrast to the geographical distribution of pandemic-induced vulnerability: the regions where vulnerable groups were most severely affected are precisely those with the weakest research presence.

An examination of institutional collaboration networks elucidates the organizational dimension of knowledge production (Fig. 7). Among the top 20 institutions by publication output, 19 are based in the United States, with University College London as the sole European representative. Notably, research institutions from China, India, Brazil, and other emerging economies are absent from this leading cohort. The United States's dominance extends beyond the sheer volume of publications to its strategic positioning within the network. Large public university systems—such as the University of California, the University of Texas, and the City University of New York—leverage their multi-campus structures to achieve both extensive geographical reach and interdisciplinary integration across public health, public administration, and sociology, thereby enabling scaled and systematic research production.

In terms of institutional typology, universities dominate the research output. Schools of public health and academic medical centers—exemplified by the Johns Hopkins Bloomberg School of Public Health—emerge as leading contributors. This disciplinary concentration reflects the pandemic's nature as a public health crisis, but also suggests the relatively peripheral role of public management as a discrete field: few schools of public management or public policy rank among the top 50 publishing institutions. Moreover, a substantial number of institutions appear to operate in relative isolation, with limited cross-institutional collaboration evident in the network structure.

Multidimensional plights faced by vulnerable groups. Evidence from the literature has demonstrated that the impact of the pandemic on vulnerable groups manifested as interconnected plights across four key dimensions: health, economy, education, and social participation (Table 1).

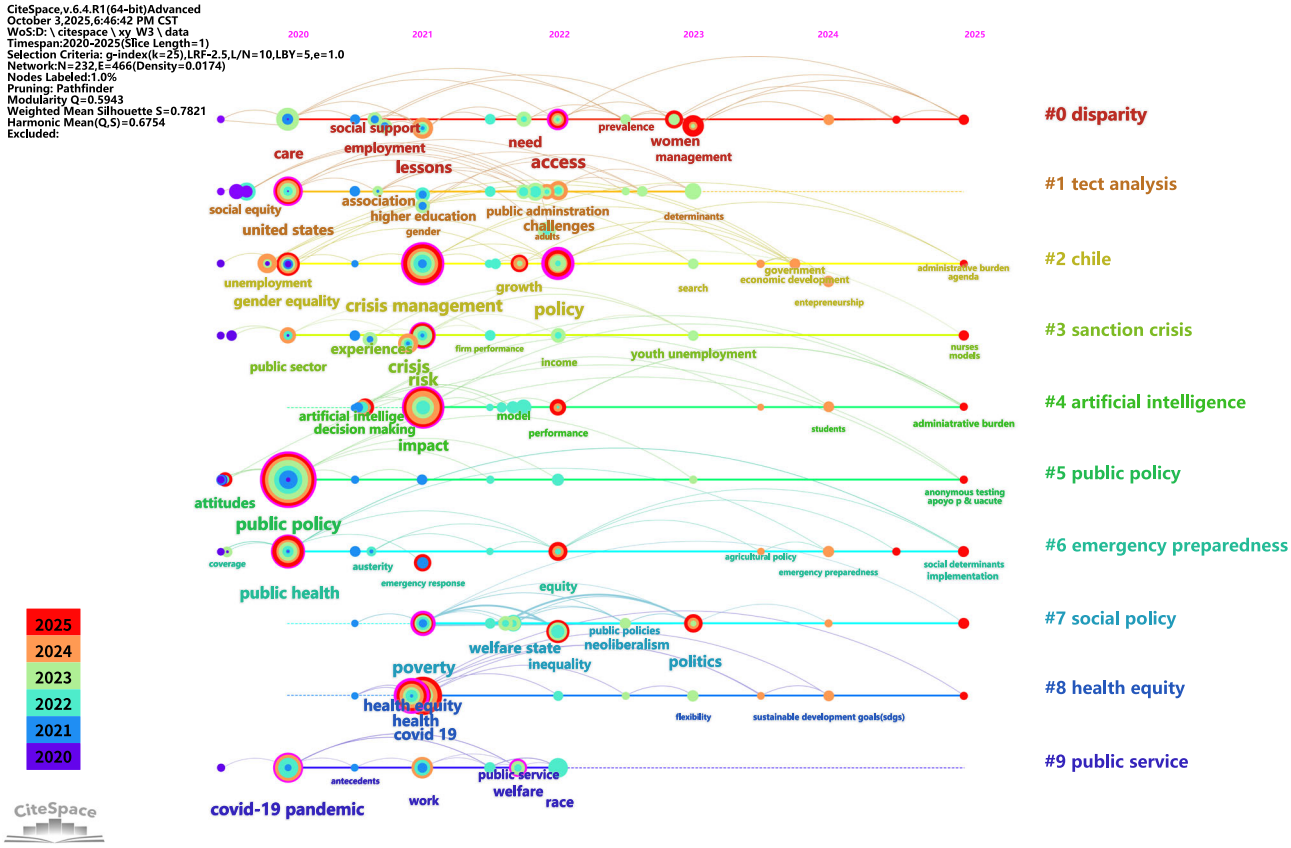

Fig. 5 Thematic cluster timeline map. Note: Horizontal lines depict the temporal span of each thematic cluster, with superimposed circles marking the publication years of highly cited articles.

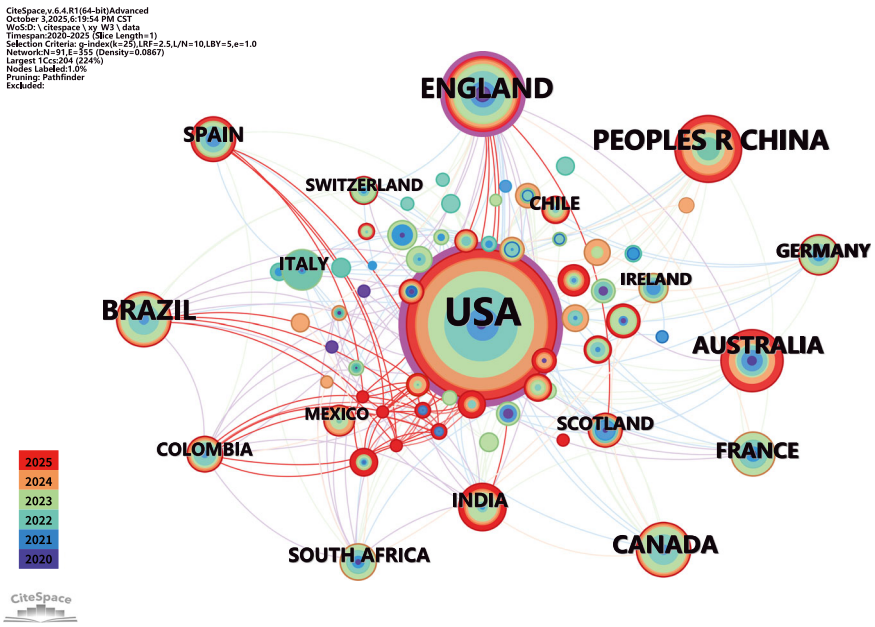

Fig. 6 Country/region collaboration network. Note: Node size corresponds to publication output; line thickness indicates the strength of collaborative ties; and color gradient represents the distribution of publication years.

Health plight: unequal risks of exposure. Extensive research confirms that vulnerable groups faced significantly higher risks of virus exposure, a direct consequence of long-standing structural factors such as socioeconomic status, living conditions, and occupational profiles (Barbosa et al., 2023). Spatial analyses from New York City revealed that infection rates in the most densely populated neighborhoods were nearly seven times higher than in the wealthiest areas at the pandemic's onset, highlighting how crowded, multi-generational households in low-income communities became high-risk environments for transmission (Borjas, 2020). Similar outbreaks in migrant worker dormitories in Singapore further corroborated

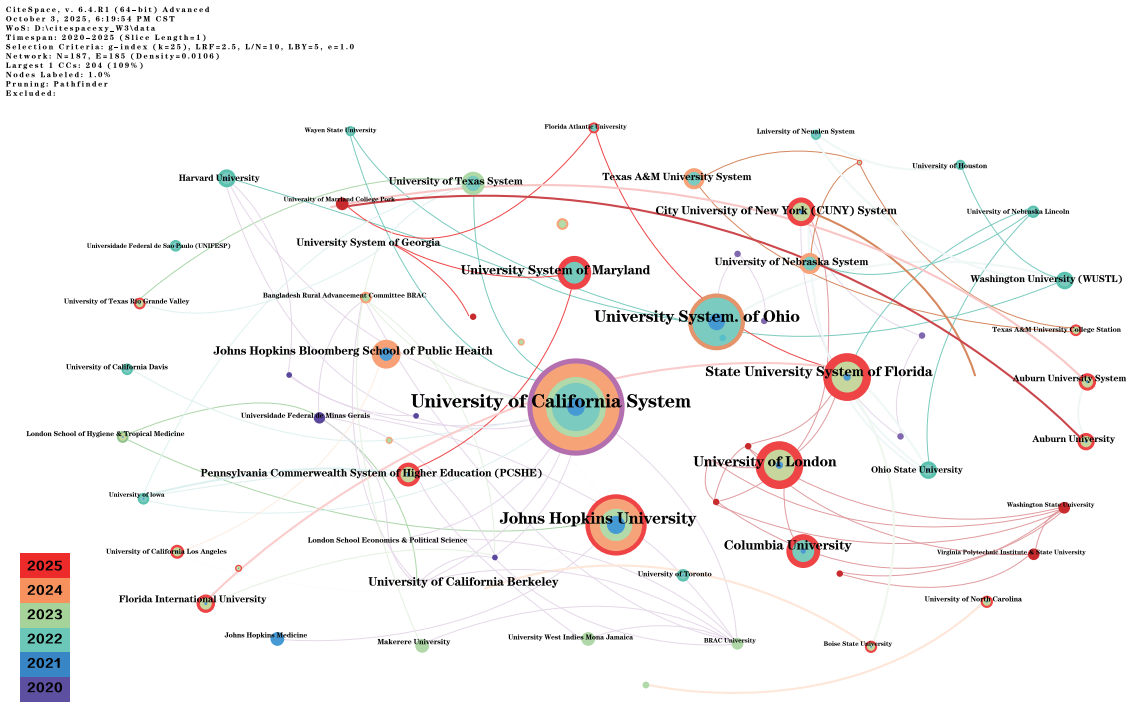

Fig. 7 Institutional collaboration network. Note: Node size corresponds to publication volume; connecting lines represent collaborative ties between institutions.

Table 1 Interconnected plights across four key dimensions.

Plights	Specifics	Causes	Intersecting plights
Health	Higher risks of virus exposure	Socioeconomic status, living conditions, and occupational profiles	Economy, social participation
	Preexisting health conditions	Chronic diseases, racial health disparities, long-term socioeconomic disadvantage	Economy, social participation, and health.
	Barriers to healthcare access	High out-of-pocket costs, uneven distribution of medical facilities, language barriers, distrust in the medical system, and fears regarding immigration status	Economy, social participation
	Social structures and power relations	Unequal institutional arrangements	Health
Economy	Labor market inequalities	Gender inequality and informal employments	Social participation
	Inequalities in the capacity to remote work	Low income and lack of digital skills	Economy, education
	Rising poverty	Plummeting income and non-income welfare losses	Health, economy
Education	Barriers to effective online learning during school closures	Lack of dedicated study space, unstable home internet, reliance on shared digital devices, and lack of basic internet infrastructure	Economy, education
	Loss of a crucial social/living platform	School lunch program interruption, loss of social interaction, prolonged isolation	Health, social participation
	Increased dropout risks	Economic distress, early marriage	Economy, social participation
Social participation	Social distancing measures	Older adults facing stringent isolation protocols, living alone, disabilities	Social participation
	Rising stigmatization and discrimination	Asian communities, immigrants, and specific occupational groups	
	Challenges for immigrant groups	Language barriers and uncertain/undocumented status	Health, economy, and social participation

the link between living conditions and infection risk (Koh, 2020).

Preexisting health conditions critically shaped vulnerability to severe COVID-19 outcomes. Patients with chronic diseases like diabetes, hypertension, and cardiovascular conditions experienced significantly higher rates of severe illness and mortality (Zhou et al., 2020). As vulnerable groups disproportionately bear the burden of chronic diseases, this pre-existing health disparity placed them in greater danger during the pandemic. Data on racial health disparities in the United States showed higher prevalence of obesity and diabetes among Black and Latino populations—conditions identified as major risk factors for severe COVID-19 outcomes (Raifman and Raifman, 2020). The social distribution of chronic diseases itself reflects deep-seated health

inequalities, where long-term socioeconomic disadvantage translates into health outcome disparities through pathways like poor nutrition, limited physical activity, high-stress environments, and harmful lifestyle factors (Cockerham et al., 2017).

Barriers to healthcare access were dramatically amplified during the crisis (Giancotti et al., 2021). Studies from the United States repeatedly highlighted how approximately 30 million uninsured individuals—predominantly from low-income groups—faced substantial financial obstacles to testing and treatment due to high out-of-pocket costs (Tolbert et al., 2020). Even in countries with universal health coverage, soft barriers persisted, including geographical inaccessibility, cultural and language obstacles, and bureaucratic complexities within healthcare systems. Research from rural and remote communities showed that pre-existing problems—such as uneven distribution of medical facilities, transportation difficulties, and shortages of specialized personnel—worsened considerably during the pandemic (Peters et al., 2008). For immigrant and ethnic minority groups, healthcare access challenges were particularly complex, where language barriers, distrust in the medical system, and fears regarding immigration status collectively deterred timely care-seeking (Crawshaw et al., 2021).

Economic plight: income disruption and livelihood vulnerability. The pandemic further exposed labor market inequalities faced by vulnerable groups. Data from the International Labor Organization indicated that global employment losses were significantly higher for women (5%) than men (3.9%), reflecting gendered labor market structures—with women concentrated in severely affected sectors like retail, hospitality, and domestic work (ILO, 2021). Workers in the informal economy faced even more dire circumstances, as they lacked access to social protections such as unemployment insurance and paid sick leave. As a result, lockdowns led to immediate income loss without institutionalized safety nets. Studies from developing countries showed that the informal sector constituted 60–80% of total employment, with most workers relying on daily wages; income disruptions therefore directly threatened their basic survival (Bonacini et al., 2021).

Inequalities in the capacity to work remotely further widened the gap in how employment was affected. Research by Bonacini et al. (2021) indicated that highly educated, skilled white-collar professionals were more likely to transition to remote work, whereas jobs in manufacturing, services, and manual labor—typically held by low-income groups—could not be performed remotely. This class-based divergence in telework ability not only affected job retention during the pandemic but may also reshape the post-pandemic labor market, potentially further marginalizing workers lacking digital skills.

Multiple national studies confirmed the association between the pandemic and rising poverty. The World Bank estimated that approximately 100 million people were pushed into extreme poverty, with those already near the poverty line being the most affected (Zhao and Rasoulinezhad, 2023). Official poverty statistics may underestimate the true severity, as static poverty lines struggle to capture the complexity of multidimensional deprivation—where non-income welfare losses in health, education, and nutrition are equally severe. Food security research in developing countries revealed direct consequences of income shocks: when household incomes plummeted, food expenditures were among the first to be cut, leading to declines in dietary quality (Pereira and Oliveira, 2020). For nutritionally sensitive groups like children and pregnant women, short-term nutritional deficiencies could lead to long-term health and cognitive impairments.

The literature on poverty trap mechanisms sheds light on the underlying dynamics. Coping strategies in response to income shocks often exhibit path dependency. To meet immediate needs, families may be forced to adopt measures that undermine long-term welfare, such as withdrawing children from school to work, selling productive assets, or reducing health and education expenditures. These adverse coping mechanisms, while offering short-term relief, can perpetuate intergenerational cycles of poverty (Khan and Ahmed, 2021).

Educational plight: learning stagnation and entrenched inequality. School closures globally affected over 1.6 billion students, yet the consequences of this universal disruption were highly uneven (Alban Conto et al., 2021). Middle-class families could provide quiet learning environments, timely academic support, and supplementary online resources, whereas parents in disadvantaged households often had lower educational attainment, unstable work schedules, and crowded, noisy living conditions, making it difficult to create an effective learning environment (Engzell et al., 2021). Surveys in OECD countries revealed that students from low-income households faced significant barriers to effective online learning, including lack of dedicated study space, unstable home internet, and reliance on shared digital devices (Beaunoyer et al., 2020). An assessment of learning loss in the Netherlands estimated that students lost an average of three months of learning progress, but the setback for students from low-education families was 60% greater than for those from highly-educated backgrounds (Engzell et al., 2021). This disparity underscores the critical role of the family as an "invisible school," where differences in parental educational capital were magnified once formal education was disrupted.

The pandemic highlighted the multifaceted role of schools. The literature emphasizes that schools are not merely sites of knowledge transmission but also crucial platforms for nutrition (through free or subsidized meal programs), social interaction, psychological support, and child protection. Research in the United States estimated that about 22 million low-income students relied on school lunch programs for essential nutrition (Gundersen et al., 2021). School closures abruptly removed this safety net, causing immediate impacts on the nutritional status of vulnerable children. The loss of social interaction also had more subtle yet significant effects on socio-emotional development; prolonged isolation could impair the development of social skills, peer relationships, and participation in collective activities.

Increased dropout risks represent the most severe manifestation of the educational crisis. Research by Khan and Ahmed (2021) focusing on developing countries projected that the pandemic could lead to millions of children— particularly girls from poor families already on the periphery of formal education—permanently dropping out of school. When families face economic distress, children—especially girls—are often expected to contribute to household chores or income generation. Even when schools reopen, accumulated learning gaps, ongoing family financial pressure, and early marriage may prevent these children from returning. Dropping out not only represents a loss of individual educational opportunity but also disrupts the intergenerational transmission of human capital, potentially cementing cycles of poverty across generations.

Social participation plight: isolation, stigma, and marginalization. Social distancing measures had markedly unequal impacts across different groups. Older adults, identified as a high-risk group, were subjected to stringent isolation protocols; however, the prolonged separation led to severe social isolation and mental health issues. Studies reported significant increases in depression, anxiety, and feelings of loneliness among the elderly during the pandemic (Ganesan et al., 2021). The situation was particularly acute for those living alone, for whom the disruption of

community support networks led to difficulties in daily care and emergency assistance. For people with disabilities, barriers to social participation were multiplied—interruptions in care services, suspension of rehabilitation therapies, closure of accessibility facilities, and cancellation of social activities posed serious threats to those relying on continuous support to maintain independent living (Armitage and Nellums, 2020).

Stigmatization and discrimination arising from the pandemic constituted another critical dimension of restricted social participation. Numerous countries reported surges in discrimination targeting Asian communities, immigrants, and specific occupational groups. Research by Gibson et al. (2021) revealed that stigmatization was not merely attitudinal prejudice but manifested concretely as employment discrimination, physical violence, and social exclusion. This stigmatization originated from multiple sources: narratives linking the disease to specific ethnicities or regions, fear-driven avoidance of certain occupations (e.g., healthcare workers and delivery personnel), and social labeling of infected individuals and their families. Victims of stigmatization were often already marginalized groups; pandemic-related stigma compounded preexisting social exclusion, further weakening their social capital and mental health.

The social participation challenges for immigrant groups exhibited distinct characteristics. Language barriers impeded access to public health information and services; cultural differences led to misunderstandings of public health measures; and uncertain immigration status deterred many from seeking official assistance. The situation was particularly difficult for undocumented migrants, whose fear of identification rendered them invisible during the pandemic, severely limiting their access to medical and economic support (Page et al., 2021). The literature emphasizes that including immigrants in pandemic responses is not only a human rights imperative but also a public health necessity—excluding any group creates potential reservoirs for virus transmission, endangering the entire community's health.

Intersecting plights. A synthesis of the literature indicates that adversities across these four dimensions exhibit intersecting patterns (Table 1). Health problems can lead to income loss and increased medical expenses, exacerbating economic plight; financial strain may force children to leave school or reduce educational investment, creating educational disadvantages; economic disadvantage limits access to digital devices and skills training, deepening the digital divide; and the accumulation of multiple plights erodes the capacity for social participation, reinforcing marginalization. This intersection does not follow a simple linear causal chain but rather forms a network of multidirectional interactions.

Public management practices in safeguarding vulnerable groups. Policy responses across nations demonstrate significant diversity. This section examines representative cases across four domains—health security, economic relief, educational equity, and social inclusion—to illuminate the underlying policy logic and implementation outcomes.

Health security: from financial access to inclusive service delivery. During the pandemic, removing financial barriers to healthcare is a primary policy objective globally. Countries adopted divergent approaches reflective of their welfare systems. In the highly marketized U.S. system, the CARES Act fully subsidized COVID-19 testing and treatment for uninsured individuals—a temporary measure that formally eliminated cost barriers for approximately 30 million people (Galvani et al., 2020). However, this Act failed to address the lack of systemic coverage, owing to multiple implementation challenges, including insufficient public awareness, complex application procedures, inconsistent interpretation by medical providers, and the policy's transient nature. This patchwork response contrasted sharply with the policy extensions seen in European welfare states like France and Germany, which leveraged existing universal health insurance systems to comprehensively cover COVID-related care, achieving superior execution efficiency and coverage (Mossialos et al., 2020).

Developing countries demonstrated innovative approaches under resource constraints. India launched one of the world's largest free vaccination programs, yet studies revealed significant gaps between policy intent and outcomes due to fragile supply chains, urban-rural distribution disparities, and varying local implementation capacities (Acharya et al., 2021). Brazil established mobile clinics in favelas (Lotta et al., 2021), while the UK and Thailand adopted "firewall" policies explicitly separating healthcare access from immigration enforcement—critical measures for ensuring that marginalized groups could seek care without fear (Crawshaw et al., 2021; Suphanchaimat et al., 2021).

Community mobilization emerged as a crucial strategy for enhancing health literacy and self-protection capabilities. Singapore organized volunteers to deliver supplies and health information to isolated seniors, while U.S. community groups distributed multilingual prevention materials (Shariff et al., 2020; Lotta et al., 2021). These locally-grounded health teams often garnered greater community trust, representing a paradigm shift from expert-led public health governance toward community empowerment.

Economic relief: institutional logic of employment protection and income support. Employment protection measures varied across labor market regimes. The U.S. Paycheck Protection Program provided forgivable loans to small businesses—an indirect approach attempting to sustain employment (Autor et al., 2020). While preventing mass layoffs short term, this employer-channel model systematically excluded informal and gig economy workers. European short-time work schemes (Kurzarbeit) allowed employees to work reduced hours while receiving government-subsidized wage compensation. These programs proved more effective in maintaining employment, offering better protection to regular than to marginal workers (Müller and Schulten, 2020).

Targeted interventions for vulnerable labor groups were implemented in several countries. For instance, South Korea established a specialized unemployment assistance program for flexible workers, while Australia provided apprenticeship subsidies to employers hiring youth aged 15–24. These measures sought to address the inadequate coverage of non-standard workers under traditional employment protection systems (Kye and Hwang, 2020). However, accurately identifying this heterogeneous group within administrative systems remains a challenge. Information asymmetry and high identification costs may lead to significant exclusion errors during policy implementation.

Cash transfer programs emerged as the most direct mechanism for income support globally, although variations in implementation design led to divergent outcomes. The U.S. distributed stimulus checks broadly, while Brazil targeted emergency aid to 55 million poor and informal workers (Banerjee et al., 2020). The Philippines and Indonesia utilized existing social registry systems or developed mobile applications to enhance targeting precision, though digital identification requirements often excluded the most vulnerable groups lacking digital access or literacy (Alatas et al., 2016).

Educational equity: multidimensional challenges of digital inclusion. Policies addressing the digital divide spanned hardware

provision, teacher training, and student support. South Korea and multiple U.S. states provided devices and internet access to disadvantaged students, though follow-up studies revealed that hardware provision alone did not ensure effective learning—household environment, parental support, and student digital literacy remained critical mediating factors (Beaunoyer et al., 2020).

Teacher capacity-building was identified as crucial for online education quality. Portugal's large-scale teacher training, Singapore's teaching resource sharing platform, and Italy's blended learning transition support all aimed to equip educators for digital transformation (Flores and Gago, 2020). However, training effectiveness was constrained by teachers' age profiles, pre-existing technological proficiency, workload, and attitudes toward technology.

Differentiated support for special populations received attention in several countries. The U.S. enforced requirements under the Individuals with Disabilities Education Act, Australia provided accessible learning materials for students with visual or hearing impairments, while China conducted special outreach for migrant children, and Italy offered language support for immigrant students (Pavlakis et al., 2021; Zhang et al., 2020). These practices recognized that achieving educational equity requires personalized support tailored to differential needs, rather than standardized services.

Social inclusion: accessibility and anti-discrimination efforts. The development of accessibility during the pandemic expanded from physical environments to the digital sphere. Initiatives to improve traditional physical accessibility continued, such as the UK requiring public transport sectors to enhance accessibility facilities, Singapore promoting age-friendly modifications in public spaces, and Japan encouraging restaurants to provide barrier-free services (Shariff et al., 2020). More notably, digital accessibility underwent a process of institutionalization—exemplified by the United States issuing Web Content Accessibility Guidelines and the European Union mandating public sector websites to comply with accessibility standards through the European Accessibility Act. These regulatory measures elevated digital inclusion from a voluntary initiative to a legal obligation (Weishaar et al., 2021).

Anti-discrimination policies were implemented across multiple fronts, including legislation, law enforcement, and public education. Canada and numerous U.S. states intensified monitoring and penalties for hate crimes, while Australia launched public awareness campaigns against racism (Gover et al., 2020). Initiatives such as the UK National Health Service's "We All Wear Masks" campaign and Canada's "I Am Not A Virus" project sought to combat stigmatization through public education. However, evaluations in the literature note that altering public attitudes is a slow process, and the lasting impact of short-term awareness campaigns remains limited. More crucially, anti-discrimination measures must be integrated into the entire policy design process. Practices such as the WHO's recommendation to avoid geographically-based disease names, the establishment of documentation-free service points for testing and vaccination for vulnerable groups across Europe, and the CDC's requirement to publish race-disaggregated health data to identify disparities—all these represent a shift from moral advocacy to institutional mechanisms in the fight against discrimination.

Cross-national comparison: divergent and convergent governance logics. Comparative analysis reveals how welfare state typologies significantly influenced policy pathways (Table 2). Nordic social democratic states rapidly expanded existing universal social protection systems, ensuring strong policy continuity. Liberal welfare states (e.g., the U.S. and the UK) resorted to unprecedented government intervention, implemented largely as temporary patches lacking institutional permanence. East Asian developmental states combined state leadership, technological drive, and community mobilization (Kye and Hwang, 2020).

Variations in resource endowments led to fundamentally different constraints. Developed countries faced challenges primarily of political will and institutional design—distributing relatively abundant resources through contested allocation mechanisms. Developing countries confronted hard budget constraints—where even well-designed policies might fail due to implementation capacity and fiscal limitations (Banerjee et al., 2020).

From a governance perspective, whether the protection of vulnerable groups is framed as a human rights obligation or a charitable act fundamentally shapes the nature and sustainability of related policies. Countries that treat the protection of vulnerable groups as a state responsibility and legal obligation generally demonstrate superior outcomes in terms of policy coverage, level of protection, and degree of institutionalization. For example, the U.S. Individuals with Disabilities Education Act mandates that states must ensure students with disabilities receive appropriate education, and the UK provides barrier-free vaccination access for undocumented migrants. These practices elevate the rights of vulnerable groups from discretionary policy benefits to legally enforceable guarantees (Pavlakis et al., 2021; Crawshaw et al., 2021). In contrast, in countries where such protection is viewed as temporary relief, policies tend to lack stability and predictability.

Our literature analysis uncovers some key principles behind successful practices: integrating vulnerable group protection into priority agendas, coordinating across sectors, engaging communities and civil society, leveraging digital technology while maintaining non-digital channels, and establishing long-term mechanisms beyond emergency response.

Discussion and conclusions

Discussion. The disproportionate impacts on vulnerable groups during crises and corresponding protective measures, particularly in the case of the COVID-19 pandemic, constitute an issue of growing importance within the Sustainable Development Goals framework. This study conducts a comprehensive literature review of 429 global publications from 2020 to 2025, focusing on (1) key research themes, evolution of research frontiers, and research output distribution; (2) the multidimensional plights faced by vulnerable groups; and (3) the protective measures implemented by public sectors worldwide. Our analysis indicates that research in this field has evolved rapidly, progressing through three distinct phases: initial problem identification, deeper mechanism investigation, and future-oriented focus. Over time, scholarly attention shifted from political concerns toward technical issues, yet four themes persisted: health equity, economic hardship, educational inequality, and social participation. However, the global distribution of research output is markedly uneven. Most studies concerning vulnerable groups in the Global South are produced by scholars from the Global North. This discrepancy highlights a critical paradox: the regions where vulnerable groups were most severely affected by the pandemic are precisely those most underrepresented in the research output.

This study employs intersectionality as a heuristic lens to illuminate the complex relationships between different dimensions of adversity. While traditional vulnerability research often focuses on single dimensions such as socioeconomic status or demographic characteristics (Cutter et al., 2003), the reviewed literature indicates that pandemic studies have a

Table 2 Cross-national policy responses: key characteristics and outcomes.

Policy Domain	Country/Region	Key Intervention	Implementation Mechanism	Reported Outcomes	Limitations Identified
Health Protection	USA	CARES Act free COVID testing/treatment	Temporary federal subsidy	Expanded coverage for 30 M uninsured	Complex application; temporary nature
	France/Germany	Universal coverage of COVID costs	Integration into existing UHC	High coverage; rapid deployment	"Soft" barriers (language, geography) persist
	India	Free mass vaccination	Priority groups + mobile clinics	World's largest campaign	Supply chain fragility; urban-rural gaps
	UK/Thailand	Immigrant-inclusive vaccination	"No questions asked" policy	Reduced fear barriers	Limited awareness among target groups
Economic Relief	USA	Paycheck Protection Program (PPP)	Forgivable loans to employers	Prevented mass layoffs	Excluded informal/gig workers
	Germany/France	Short-time work scheme (Kurzarbeit)	Wage subsidy for reduced working hours	Maintained employment stability	Limited reach to atypical workers
	Brazil	Emergency cash transfer (Auxílio Emergencial)	Direct payments to 55 M	Rapid poverty mitigation	Targeting accuracy challenges
	Philippines/ Indonesia	Digital application for cash aid	Mobile app + registry	Improved efficiency	Digital exclusion of the extreme poor
Education Equity	South Korea	Free devices + internet for low-income students	Direct distribution	Closed hardware gap	Home environment/ "soft" factors unaddressed
	Portugal	Teacher digital training at scale	National program	Enhanced teaching capacity	Varied teacher uptake/ readiness
	USA (IDEA compliance)	Disability services continuation	Legal mandate	Ensured special education	Rural/resource-poor areas struggled
	China	Migrant children enrollment campaign	Door-to-door outreach	"Zero dropout" goal	Short-term nature: sustainability unclear
Social Inclusion	UK/EU	Digital accessibility standards	Legal requirements for public sites	Institutionalized inclusion	Enforcement gaps
	Canada	Anti-racism public campaigns	"I Am Not A Virus" movement	Raised awareness	Slow attitude change; limited long-term impact

Note: Outcomes are drawn from literature reports; rigorous evaluation is limited for most interventions.

multidimensional understanding of vulnerability: challenges in health, economics, education, and social participation do not exist in isolation but intersect with each other. For instance, health issues can exacerbate economic hardship through increased medical expenses and reduced earning capacity, while economic strain may force families to curtail educational investments or even withdraw children from school. These relationships do not conform to simple linear causality but rather form a network of multidirectional interactions. Therefore, an intersectional perspective rather than single-dimension classification is crucial for identifying individuals at the confluence of multiple disadvantages. The literature consistently confirms that a low-income single mother with an immigrant background, for example, faces qualitatively distinct plights resulting from the interaction of her immigrant status, economic disadvantage, and gender—a burden greater than the mere sum of its parts (Gibson et al., 2021).

Despite a great number of documented innovative practices for protecting vulnerable groups during the pandemic, public sector responses overall remain surprisingly limited. First, most national efforts were confined to emergency measures, lacking systematic and sustainable approaches. However, the effectiveness of protection measures depends more on robust, routine social security capacity than on temporary policies (Indesveen and Breck, 2021). This underscores the insight that crises tend to expose, rather than create, underlying inequalities, often revealing deep-seated systemic weaknesses in their most acute forms. Second, most existing policies rely on single-dimensional targeting (e.g., by age, gender, or income), potentially overlooking individuals at the intersection of multiple disadvantages. This overlook can lead to the implementation of protective measures that exacerbate inequalities, such as the excluded informal and gig economy workers in the U.S. Paycheck Protection Program. Third, participatory governance faces structural constraints from power imbalances, where formalistic participation risks devolving into a tool for legitimizing decisions rather than ensuring genuine influence. Countries that successfully mobilized community and engaged civil society were better able to identify needs and provide tailored support (Lotta et al., 2021), indicating the necessity for a paradigm shift from *providing for* vulnerable groups to *working with* them, emphasizing empowerment over charity. However, the literature also cautions that participatory governance is not a panacea: in contexts of deep marginalization and entrenched power inequality, the inclusion of vulnerable groups may be symbolic, with their voices bearing minimal weight on final decisions. Finally, the discourse of rights is not a neutral technical tool but is embedded in the fundamental debates about human dignity, equality, and freedom. Tensions between universal human rights claims and culturally specific understandings must be navigated carefully. Moreover, an overreliance on legal rights may lead to the judicialization of social problems, transforming distributive conflicts that should be resolved through political deliberation into technical legal disputes and, in turn, potentially weakening democratic engagement.

Conclusions. To advance the study of plights faced by vulnerable groups and corresponding protection measures in the context of the COVID-19 pandemic, future research should explore the following directions. (1) Greater emphasis should be placed on participatory action research. Given the current imbalance in global research output, this approach can help dismantle the hierarchical researcher–researched relationship by repositioning vulnerable groups as co-producers of knowledge rather than passive subjects. Only those with lived experience can fully articulate the complexity of their own realities (Collins, 2000). (2) Future studies should further explore the interlinkages between health, economic, educational, and social participation challenges. Methodologies such as network and spatial econometric models would enable researchers to move beyond linear explanatory frameworks. (3) As digital vulnerability has emerged as a new mechanism of social stratification in the 21st century, future inquiry should reimagine the ownership structures, governance models, and value distribution of digital technologies.

To enhance the effectiveness of public management in protecting vulnerable groups, we propose five recommendations for institutional design and policy implementation. (1) Governments should transition from taking reactive emergency responses to building proactive, comprehensive social protection systems that explicitly align the protection of vulnerable groups with the UN Sustainable Development Goals. (2) Policy designers must adopt assessment tools for multidimensional vulnerability to address intersectional blindness arising from systemic targeting biases and accurately identify individuals with overlapping disadvantages. Policy designers should adopt assessment tools for multidimensional vulnerability to address intersectional blindness arising from systemic targeting biases and accurately identify individuals with overlapping disadvantages. The application potential of emerging technologies (such as artificial intelligence and big data) in identifying vulnerable groups, enabling precise resource allocation, and real-time monitoring of policy effects should be considered (Lopreite et al., 2021). For instance, machine learning algorithms can integrate multidimensional data sources (e.g., social media, health records) to construct vulnerability prediction models (Lopreite et al., 2024). (3) Digital inclusion policies should look beyond technical fixes such as device provision, and enhance well-being by systematically addressing the three levels of the digital divide: hardware access, digital literacy, and the capacity to meaningfully use technology. (4) Participatory governance must empower marginalized groups beyond tokenistic consultation by establishing power redistribution mechanisms that guarantee their effective voice in decision-making processes. (5) Countries should develop crisis preparedness protocols based on lessons from the pandemic, formally integrating the protection of vulnerable groups into response frameworks for future public health emergencies and other crises.

This study has several methodological limitations. The literature search was confined to English-language publications in the Web of Science Core Collection and Scopus. While this approach ensured academic quality and standardization, it may have excluded some studies from other databases or languages—particularly indigenous research from the Global South and non-Western theoretical contributions. Such language bias may inadvertently reinforce existing inequalities in global knowledge production. Furthermore, while the inductive approach of a systematic scoping review is well-suited to identifying research patterns and knowledge gaps, it offers limited capacity to establish causal relationships between different dimensions of adversity. Current understanding of these linkages relies largely on observational studies and theoretical inference; thus, more rigorous causal validation methods—such as structural equation modeling or quasi-experimental designs—are needed. These limitations were carefully considered in our interpretation of the results, and offer valuable guidance for methodological refinement in future research. Third, as with any systematic review, our search results are susceptible to publication and indexing delays. Although our search scope was extended through September 2025, some relevant studies from that year may not yet have been published or indexed in the selected databases (e.g., Web of Science, Scopus). Therefore, the 2025 literature included in this review should be viewed as representing early, accessible trends rather than to provide a complete and comprehensive representation of the literature from that year.

Data availability

All raw data and processed data involved in this study are available at https://github.com/policy-ana-pro-max/Public-management-in-the-COVID-19-pandemic.

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Author contributions

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Competing interests

The authors declare no competing interests.

Ethics approval

Ethical approval was not required for this study because it involved a review and analysis of publicly available published literature and did not involve human participants or confidential data.

Informed consent

Informed consent was not required for this study because it did not involve human participants, human data, or identifiable personal information.

Additional information

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