The COVID-19 impact on humanitarian operations: lessons for future disrupting events

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1. Introduction

During wide spread of Corona Virus Disease (COVID19), it has been recorded that humankind plays a responsive role in collaboration with societies, governing authorities and controlling agencies (Haque and Islam, 2018) while managing resources during man-made or natural disasters. Sufficient literature is being noticed focusing on humanitarian relief operations (Anparasan and Lejeune, 2017) and supply risk mitigations (Maghsoudi et al. 2018) incurred due to the disasters. However, the role of volunteers and the workforce in relief planning, and recovery for pandemic and complex emergencies have not been explored adequately (Harpring et al. 2021). Furthermore, it is necessary to bring out clarity on how the way of managing humanitarian operations services differ during pandemics, man-made, and nature-inspired disasters. Models are developed to manage manpower and resources (Kebriyaii et al. 2021), vehicle capacities (Ershadi and Shemirni, 2021), and routing (Breitbarth et al. 2021) to protect and serve the vulnerable communities with essential supplies during pandemics. But, it raises the question of whether existing logistical networks and infrastructures are enough to aid necessary supplies during these events.

The COVID19 outbreak spreads quickly, the neighbouring or non-affected geographies may be considered temporary humanitarian hubs to serve emergency logistics services, medical supplies and food aids. Therefore, logistical infrastructure development programs are encouraged to combat the

impact of such future pandemics (Stauffer et al. 2020). Also, where and how many hubs are needed to assist food and necessary supplies in COVID19 affected terrains? Yagci Sokat and Altay (2021) identified the lack of research on the investigation of operational and logistical challenges of serving vulnerable populations through cross-sectoral partnerships. Sometimes, the least developed countries and vulnerable communities need the aid of cash along with medical, food assistance and emergency vaccination. So, how to allocate vaccines on basis of their health data, age, and diet becomes an urgent issue of resolution for the health departments.

Frederico (2021) discusses the importance of disruptive technologies for enhancing resilience in supply chains and food tracking (Li et al. 2020). Recently, Jebbor et al. (2021) identify the Artificial Intelligence (AI)-based forecasting model for predicting hospital asset consumption under disruptive incidents to improve hospitals' response to disasters/pandemics situations. However, the role of Information and Communication Technology (ICT) for humanitarian safety at emergency services such as hospitals and workplaces during pandemics is yet unexplored. Further, the medical workers and emergency service providers are, insisted to work despite temporarily suspended travelling and migrations. Certainly, technology and data analytics play a vital role here for the people and local commodity movements (Mkansi et al. 2019), but how can this technology play a role in organizational performance, and quick, safe, and secure transportation of men and materials to the pandemic affected terrains is awaited challenge to address. It is also expected to answer, how digitization play role in developing dynamic capability and resource allocation would be useful for the humanitarian organization to reduce risk during a pandemic.

Studies contributing towards raised research issues of humanitarian operations, emergency aid, community help during COVID19, and lessons learnt from the pandemic are discussed in section 2 along with their research implications. Section 3 put forward the practice-oriented policies and decisions that humanitarian organizations, communities, govt. and Non-Governmental Organizations (NGOs) can use to combat such future disrupting happenings helping mankind. Finally, further derived issues and research questions that need to be addressed in future along with the limitations of each selected study are concluded in section 4.

2. Contribution towards Literature

The broader objective of this research covers the COVID19 learnings and experiences of humanitarian communities for necessities with a focus on food supply and medical assistance, logistics and infrastructural development, emergency crisis management, social preparedness and relief programs. The contribution of each study is analyzed (Appendix-I) and detailed below on basis of addressed

research issues, adopted methodology, geographical scope, limitations, respective beneficiaries, allied humanitarian policy and supply chain decisions.

First: Handfield et al. (2022)-contributes towards the way of managing humanitarian readiness and supply chain preparedness against pandemics. Though defence personnel were directly engaged framing emergency response guidelines, the proposed framework is expected to be validated through concrete method with data or real cases in different contexts, so that the government officials can assertively adopt it. The second paper by Verma et al. (2022) conducts semi-structured interviews with manufacturing firm managers to explore opportunities and challenges, and assess them using multi-criteria ranking technique named TOPSIS while adopting supply chain changes. The infrastructure and wages are found to be primary challenges, whereas the order fulfilment and supplier-customer relationships development emerged as prominent opportunities. The study is expected to be supported by a more concrete and accurate assessment method for supply chain risk and disruption theory. Third: Sahinyazan and Araz (2022)-collects health and nutrition data from least developed geographies of the USA under scarcity of vaccines and derived measurement index for more vulnerable communities that help prioritizing distribution schedule for humanitarian aid, food and medicines. It concludes that the food desert, COVID19 mortalities, and population proportion has a positive correlation with the fatality ratio. The hospital capacity and other disease data are not accounted for while measuring vulnerability scores.

The fourth paper (Khakan et al. 2022) collects global data from the Bloomberg database with a prescribed timeline (2010-2020) and assesses the empirical role of ICT on health-and-safety concerns raised during COVID19. The regression results reveal the significant and positive hypothetical relationship between market performance and health-safety measures of IT firms. Fifth: Joshi et al. (2022)-contributed toward policy development under dynamic organizational capability and resource allocation theory for reducing risk during pandemics. The author(s) surveyed with district magistrates in an Indian province for humanitarian survival and recovery plans for emergencies. Sixth: Rahman et al. (2022)-conducted thematic bibliometric mapping and citation based meta-analysis published in the area of humanitarian supply chain pre-during-and post pandemic era. A Scientometrics analysis with other data sources would help to identify the research emergent directions on awareness, training and development plans for the disaster management and relief serving authorities would be benefitial in fiture.

3. Practical Implications

The outcome of each study implicates the design of humanitarian policies by the government and NGOs, bureaucrats, policymakers, and disaster management personnel to resolve community problems

created due to COVID19. The first study could be used by the medical practitioners to plan emergency resilience policy against pandemics due to reliance on overseas manufacturing and insufficient strategic stockpile. The second paper is adopted by toy manufacturing firms to measure and improve organizational and supply chain performance. The government and public healthcare practitioners may adopt a third paper and coordinate with each other to schedule vaccination and plan its allocation among the community on basis of different health and dietary data. The humanitarian organizations and the united nations high commission may validate model proposed in fourth paper in combination with a qualitative approach to understand the gravity of employee safety and derive firm-level operations policies. The fifth paper can be useful for humanitarian organizations and disaster relief firms to design disaster recovery policies and mitigation plans, and social, health, and economic policies through ICT applications. The last paper sees how the neighbouring countries were used as humanitarian hubs to supply food, medical aid and other emergency supplies. A thorough analysis of each paper would help researchers to draw new directions in humanitarian operations paradigms and the practitioners can learn lessons to reform supply chains.

4. Conclusions

The overall objective of this issue was to investigate the impact of COVID19 on humanitarian operations that helps to combat future disrupting supply chain events. It includes research articles on supply chain preparedness, and workforce and organizational readiness. It also covers humanitarian aspects of vaccination scheduling and distribution for least developed countries and vulnerable communities towards disaster relief operations. The role of government agencies and health workers to form policies for employee safety and disaster risk reduction models for unforeseen pandemics is also an important consideration of this issue. Though multiple authors (s) from different geographies have participated, only selective studies are qualified for publication due to thematic restrictions of this issue. The recorded limitations of each study are mapped with unaddressed research issues which would help readers to derive new future research directions.

The COVID19 impact on Healthcare supply chain preparedness (Handfield et al. 2022) and manufacturing readiness (Verma et al. 2022) is investigated to assess the disruptions. These studies could be further extended to ensure flawless supplies under epidemically controlled travelled geographies as this issue was coined by Dasaklis et al. (2012) and is yet unaddressed. The study of Sahinyazan and Araz (2022) tried to plan the supply of medical aid and assistance for least developed countries and vulnerable communities. It could be further explored along with logistical infrastructure development and social awareness programs that would help humanitarian supply chains and WHO combat the impact of the COVID19 outbreak. In their investigation, Rahman et al. (2022) have found

the need for research focusing on recovery strategy in humanitarian supply disruptions mitigations, relief operations, and disaster prevention. The supply chain immunity framework derived by Handfield et al. (2022) could be tested with humanitarian supply chains to design a recovery strategy under COVID19 disruptions. The scholars could also examine the key differences in managing humanitarian operations during the pandemic, man-made and nature-inspired disasters.

The global sourcing and distribution planning strategies should be made more harmonized through supply chain hubs and multi-modal logistics networks designed for humanitarian aid during the pandemic. Supply chain hub design cost-benefit analysis of adopting temporary or permanent hubs would be of interest for the organizations to ensure sufficient humanitarian aid. Research on managing vehicle rental programs for medical and financial aid would also be beneficial for International Humanitarian Organization (IHO) to re-structure supply chain networks during and post-pandemic. The public transportation systems received more reliance to rescue the distribution operations ensuring sourcing and storage management of perishables, food and other consumable commodities during COVID19. But, the disruptions happened because of the non-functioning of warehouses due to the dearth of labour and truck drivers' safety concerns in infected regions (Singh et al. 2020).

The service providers' safety and workplace sanitization are also essential here to retain the continuation of necessary supplies. As per the outcomes of Khakan et al. (2022) and Joshi et al. (2022), ICT offers safe and contactless workplace services for emergency planning and disaster risk reduction. Such models could be further extended using data analytics and machine learning techniques to predict disaster risks. Though recently multiple studies have been witnessed (Chakrabotry et al. 2021) applying technological solutions towards secure transportation during pandemics, further literature building on "How the technology could play the role for quick, safe, and secure transportation of man and materials to the epidemically affected terrains" is awaited challenge to address. Also, as an emergency response, cash donations, charities, or in-kind aids proved to be effective reliefs to protect beneficiaries from market externalities (García Castillo, 2021). Therefore, the role of ICT mediums such as Television, e-mails, and social media must be pitched upon to re-frame CSR and NGO's fundraising policies and supply emergency relief operations during pandemics. Further, the role of the community in a collaborative humanitarian (civilians-policemen, health workers-corona warriors, public-private) mode to assist food and necessary supplies in COVID19 restricted terrains is also expected to address (Bakhshi et al. 2022). Also, sophisticated awareness and training programs would be helpful to encourage societal communities to help combating the impact of a pandemic.

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Appendix-I

Article #	Author(s)	Addressed theme of proposed issue	Allied Research Question/Objective(s)	Methodology	Data/Geographical Scope	Findings	Contribution	Implications	Beneficiary Stakeholders	Humanitarian Policy/Organization Decision	Limitations	Future Research Mapping
1	Handfield et al. (2022)	Supply Chain readiness and preparedness against pandemic	How the way of managing humanitarian operations differ while handling supply chains during pandemic?	Engaged Scholarship	Interview with Defense Personnel and Supply Chain Managers	Immunity fraemwork for supply chain preparedness	COVID19-19 emergency response in the medical and healthcare supply chain systems, due to reliance on overseas manufacturing and insufficient strategic stockpile	Immunity Framework to develop supply chain preparedness	Medical Practitioners	Healthcare sector may plan emergency resiliance policy against pandemics	Methodological Validation	Humanitaria
2	Verma et al. (2022)	Supply Chain readiness and manufacturing preparedness against pandemic	Investigate impact of COVID19 on supply chain flow disruptions	Multi criterial Ranking Technique-TOPSIS	Semi-structured Interviews	Infrastructure and wages are primary challeges. Order fulfilment and supplier-customer relationships development are prominent opportunities.	Challenges and Opportunities during COVID19-19	Improve Supply Chain Planning during Pademic	Supply Chain Practitioners	Manufacturing firms can measure and improve performance	More Concreate and accurate assessment method	Multi-modal COVID19 a

Sahinyazan and Araz (2022)	Humanitarian aspects of medical aid and assistance for least developed countries and vulnerable communities	COVID19 Vaccination Planning on basis of Social vulnerabitiy and food access	Statistical Analysis	USA Health and Nutrisions Data	Food desert, COVID19-19 mortalities, and SNAP population proportion has a positive correlation with the fatality ratio. Therefore, the vaccine allocation may overlook vulerable communities and create desease hotspots.	Identify and Prioritize more vulnerable communities to decide vaccin allocation.	Scoring outcome is helpful for humanitarian aids, food and medical distribution	Public Health Policy Makers	Vaccination Scheduling and Distribution Planning	Hospital Capacity and other desease data not accounted while measuring vulnerability score.	Social aware
Khakan et al. (2022)	Role of ICT 47	Investigate the for humanitarian safety at workplace during pandemics	Empirical and relationship between performanc e and health safety of	Bloomberg-Regression	IT employee 2010 to 2020	Workers' Health-safety mesures increased during COVID19	Response to Health-Safety Policy	Humaniratian crisis	Social, Organization s	Quantitative Health, Economic Policies	Prediction m apporach can be validated further
Joshi et al. (2022)		Role of ICT for humanitarian emergency planning and disaster risk reduction	employees How Digitizatio n play role in developing dynamic capability of Humaniratian Organizatio n?	Empirical	Indian Law Makers	Emergency plans through Digital Humanitaria n	Emergency plans through Digital Humanitaria n	Survival and Recovery Plans during emergencies	Govt. agencies, Disaster Managemen t teams and Humaniratia n Organizatio ns	Digital Humanitaria n strategy helps to design distater recovery policies and mitigation planning	Geographic a l Survey Scope

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Ra m n et al. (20 !2)	Examining the Trend of Humanitarian Supply Chain Studies: Pre, During and Post COVID19-19 Pandemic	To explore research trend published in the Humanitarian SC in pre, during and post era of pandemic COVID19-19	Bibliometric Mapping and Metadata Analysis	Scopus-2006 to 2022	More studies are expected on relief operations and disaster management .	Thematic mapping and citation analysis	Researchers can use the outcome to identify multiple research arenas pre-and-post COVID19	Policy makers and NGOs	See how the neighboring countries were used as humanitarian hubs to supply food, medical aids and other emergency supplies.	Confined to Scopus source, Search mechanism	The scholars role in quick and secure recovery str operation an