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Short Communication

The relationship between fever rate and telework implementation as a social distancing measure against the COVID-19 pandemic in Japan



T. Kawashima ^{a, b, 1}, S. Nomura ^{b, c, 1}, Y. Tanoue ^{b, d, 1}, D. Yoneoka ^{b, c, e, 1}, A. Eguchi ^{f, 1}, S. Shi ^{g, h, 1}, H. Miyata ^{b, *}

^a Department of Mathematical and Computing Science, Tokyo Institute of Technology, Tokyo, Japan

^b Department of Health Policy and Management, School of Medicine, Keio University, Tokyo, Japan

^c Department of Global Health Policy, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan

^d Institute for Business and Finance, Waseda University, Tokyo, Japan

^e Graduate School of Public Health, St. Luke's International University, Tokyo, Japan

^f Center for Preventive Medical Sciences, Chiba University, Chiba, Japan

^g Department of Systems Pharmacology, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan

^h Laboratory for Synthetic Biology, RIKEN Center for Biosystems Dynamics Research, Osaka, Japan

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ABSTRACT

Objectives: On March 28, the Japanese government decided on the “Basic Policies for Novel Coronavirus Disease Control” and called on the public to thoroughly implement social distancing measures (i.e., behavioral restrictions to limit the frequency and intensity of human contact), especially telework.

Methods: We used population-level questionnaire data from a social networking service (SNS), with 275,560 respondents from March 5 to April 6, to evaluate the relationship between telework implementation and the presence of a fever (body temperature higher than 37.5 °C) within 1 month as a surrogate indicator of COVID-19 infection, by occupation type and age-group.

Results: Among company employees, statistical significance was identified in the 15- to 29-year and 30- to 59-year age-groups, showing higher fever rates in the non-teleworker group (for the 15- to 29-year age-group, non-teleworkers: 7.64%; teleworkers: 6.45%; $P = 0.02$; for the 30- to 59-year age-group, non-teleworkers: 3.46%; teleworkers: 3.14%; $P = 0.02$).

Conclusions: Telework remains a controversial topic in Japan as the government called for emergency measures. Although caution is warranted in interpreting our findings because our data are limited to the voluntary SNS users, they will be essential to push forward with more measures to promote social distancing measures in the midst of Japan's current tense political climate.

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Introduction

The World Health Organization (WHO) officially declared the outbreak of infectious coronavirus disease 2019 (COVID-19) as a pandemic on March 11, 2020, calling for preventive action against the spread of COVID-19.¹ Preventive measures are categorized into those requiring individual-level efforts, such as handwashing, and

those requiring social efforts, such as telecommuting, also known as telework.^{2,3} Telework refers to a flexible way of working that is not limited by location or time, using information and communication technology. On March 28, the Japanese government decided on the “Basic Policies for Novel Coronavirus Disease Control” and called on the public to implement social distancing measures (i.e., behavioral restrictions to limit the frequency and intensity of interpersonal contact), with an emphasis on telework.⁴ In this study, population-level questionnaire results were used to evaluate the relationship between telework implementation and the presence of a fever, defined as a body temperature higher than 37.5 °C within one month, as an surrogate indicator of COVID-19, by occupation type and age-group.

* Corresponding author. Department of Health Policy and Management School of Medicine, Keio University, 35 Shinanomachi, Shinjuku-ku, Tokyo, 160-8582, Japan. Tel.: +81 35363 3774; fax: +81 33225 4828.

E-mail addresses: h-m@keio.jp, hiroaki.miyata@gmail.com (H. Miyata).

¹ Shared co-first authorship.



Fig. 1. Fever rate and telework implementation by occupation and age-group. Light grey: non-teleworker; dark grey: teleworker. The numbers above the bar graphs represent, from left, the number of those having fevers higher than 37.5 °C and the number of all respondents. * $P < 0.05$. The ratio of fever rate among non-teleworkers to teleworkers (95% confidence intervals) is as follows: (1) 1.18 (1.02–1.38), (2) 1.10 (1.01–1.19), (3) 0.96 (0.61–1.56), (4) NA, (5) 1.02 (0.74–1.43), (6) NA, (7) 1.61 (0.98–2.83), (8) 0.84 (0.65–1.09), and (9) 1.13 (0.87–1.51).

Methods

On March 5, 2020, Kanagawa Prefecture, the second most populous prefecture in Japan with about nine million people, launched an individualized support program for residents using the LINE chatbot (the largest social communication application in Japan with about 83 million active users, accounting for 65% of Japan's population) as a way to monitor the spread of COVID-19 and associated societal factors. Through LINE, the prefecture shared a questionnaire that asks users about their current and past month's physical condition and what type of actions they are taking to prevent infections. It also asks about gender, age, and occupation. After filling in the questionnaire, users were provided with personalized information on how to prevent infection. We obtained and analyzed data on the initial responses of individuals in Kanagawa Prefecture.

We considered respondents aged older than 15 years during a period from March 5 to April 6. In addition, to correct for

confounding effects, the analysis was limited to those who reported implementing basic public health precautions such as handwashing, gargling, mask wearing, and crowd avoidance. The data were separated into five occupations: company employees, part-time workers, civil servants, self-employed, and others. Students and the unemployed were excluded from the analysis. For occupations with a sufficient sample size, the ages were divided into age-groups of 15–29 years, 30–59 years, and 60+ years. Significant difference tests were performed using the chi-squared test or Fisher's exact test (when frequencies were lower than five in a two-by-two table).

Results

We used the data of 275,560 respondents during the study period. Fig. 1 shows the percentage of people who reported a fever within one month, among teleworkers and non-teleworkers, respectively, separated by occupation and age-group. Among company employees, a statistical significance was identified in the

15- to 29-year and 30- to 59-year age-groups (for the 15- to 29-year age-group, non-teleworkers: 7.64%; teleworkers: 6.45%; $P = 0.02$; for the 30- to 59-year age-group, non-teleworkers: 3.46%; teleworkers: 3.14%; $P = 0.02$), showing higher fever rates in the non-teleworker group. No statistically significant difference was identified for other occupation types.

Discussion

This study shows that teleworking has significant association with fever as a surrogate symptom of COVID-19 among company employees aged 15–59 years. For other occupations and age-groups, although there were differences in percentages, the small sample size may have prevented statistical significance. Note that our data are limited to the voluntary users of LINE app in one prefecture, and confounding factors were not adjusted. In addition, fever is one surrogate, not absolute, indicator of the status of infection with COVID-19.

The WHO and governments in several countries also recommend telework as a means of preventing the spread of COVID-19 in the workplace, which allows people to continue working while protecting themselves from infection.^{3,5} However, the implementation of telework is generally out of a person's control and requires some form of social support.⁶ To promote telework, paradigm shifts in organizational management and communication methods and workflow processes are required. Given the rapid spread of COVID-19, we expect that the results will be used as one of the scientific evidence to support the social adoption of telework in Japan.

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Ethical approval

Ethical approval was granted by the Ethics Committee of Keio University School of Medicine, under authorization number 20190338.

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Competing interests

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Author contributions

T.K., S.N., Y.T., D.Y., A.E., and S.S. contributed to the concept and design of the study. All authors contributed to acquisition, analysis, or interpretation of data. T.K., S.N., D.Y., and A.E. contributed to drafting of the manuscript. All authors contributed to critical revision of the manuscript for important intellectual content. D.Y. and A.E. contributed to statistical analysis. S.N. and H.M. contributed to administrative, technical, or material support. H.M. contributed to supervision. All authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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Review Paper

The right to health, public health and COVID-19: a discourse on the importance of the enforcement of humanitarian and human rights law in conflict settings for the future management of zoonotic pandemic diseases

M.C. Van Hout ^{a,*}, J.S.G. Wells ^b^a Public Health Institute, Liverpool John Moores University, United Kingdom^b School of Health Sciences, Waterford Institute of Technology, Ireland

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ABSTRACT

Objectives: The catastrophic effects of armed conflict, particularly prolonged armed conflict, on individual and public health are well established. The 'right' to healthcare during armed conflict and its lack of enforcement despite a range of United Nations mandated requirements regarding health and healthcare provisions is likely to be a significant feature in future conflicts, as zoonotic-induced pandemics become a more common global public health challenge. The issue of enforcement of health rights assurance and its implications for the public health management of global pandemics such as coronavirus disease 2019 (COVID-19) in and between countries and regions in conflict is the objective of this Review.

Study design: A narrative review was conducted.

Methods: Referenced to the framework of International humanitarian law (IHL) and International human rights law (IHRL) to explore and discuss the deficits in health rights assurances in conflict settings and illustrate how gaps in protection and lack of enforcement compounds the disease response. Both IHL, and IHRL can be leveraged to ensure human and health rights are assured in conflict settings. There is a distinct lack of international criteria with regard to standards of healthcare coverage, infrastructure and service preservation to the civilian population during times of armed conflict. This has far reaching consequences when confounded by a pandemic or even localised disease outbreak.

Results: We illustrate how in a pandemic disease emergency, such as COVID-19, all life is threatened; and how leaving the citizen population exposed to this contagion is a human rights breach and an indirect method of warfare. The consequences of failure to effectively address such pandemic infections, (i.e. COVID-19), in a conflict setting are potentially catastrophic as prevention and containment responses are severely constrained by state insecurity, political instability, terrorism, repression, rights abuses, and displacement of citizens. Neglect by State actors potentially constitutes a breach of the universal right to life. States cannot justify their failures to mitigate disease based on claims of lack of resources, even when available resources are minimal. Where discrimination of people with a disease, such as COVID-19, or minority groups at the point of access to health facilities occurs, this further breaches the principle of medical neutrality.

Conclusions: The example of the COVID-19 response may offer a viable route to leverage greater access and coverage of healthcare in conflict and humanitarian settings. A radicalised partnership approach during these times of emergency is warranted, based on an ethical 'humanitarian intervention' approach to provide care to all affected by contagious disease in conflict settings.

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* Corresponding author.

E-mail addresses: m.c.vanhout@ljmu.ac.uk (M.C. Van Hout), j.s.wells@wit.ie (J.S.G. Wells).

Background

Ian Morris¹ in his recent work on the relationship of war to civilisational change, predicts that the interaction of pandemics with intranational and international conflict will be a defining feature of global history over the next 40 years. The coronavirus disease 2019 (COVID-19) pandemic and the questions of public health management it raises in conflict zones is an illustration of this. It highlights a range of questions in relation to a 'right' to healthcare during armed conflict and its lack of enforcement despite several United Nations (UN) mandated requirements. In this context, disease knows no borders. On the surface, international mandates to provide non-discriminatory health care during armed conflict would appear to be in the interests of parties to a conflict, for example, in the context of *realpolitik* to ensure that their own war fighting capabilities are not threatened by disease spread.² It is also in the interests of actors not involved in the conflict, particularly those bordering a conflict zone, from where spread of disease can threaten their social, economic and political stability.^{3,4} Yet, despite the obvious issues of self-interest, these mandates are often not implemented for a variety of reasons, such as infrastructure breakdown, prejudice and the use of disease as a war fighting means to exert political pressure on opponents or other interested parties.³ Lack of consequences for actors who decide not to uphold rights to health care and well-being in terms of enforcement would appear to play a part in this. This lack of enforcement and its implications within the context of the rise of global pandemics such as COVID-19 is the subject of this Review.

Tackling disease during war times

The catastrophic effects of armed conflict, particularly prolonged armed conflict, on individual and public health are well established.⁵ Health systems' impacts include the deliberate targeting of clinical facilities; operational interference through the looting of supplies, the arrest and sometimes execution of healthcare personnel, the coercion of clinicians to provide partisan care and obstructed access through destruction and/or blockade of facilities.⁶ Healthcare personnel within a conflict zone themselves may choose to only provide or prioritise the care of one side in a conflict over that of another. Finally, the global shortage of healthcare workers,^{7,8} particularly in Western Countries,⁹ means they are highly mobile and often choose to migrate to other countries, particularly to the West, when conflict is prolonged.¹⁰

Thus armed conflict steeply increases individual and population vulnerability to health risks (vectors, violence).^{11–14} Vulnerability in this sense is the 'degree to which a population or an individual is unable to anticipate, cope with, resist and recover from the impacts of disasters. It is a function of susceptibility and resilience'.¹⁵ The disease burden of infectious disease is well evidenced in estimates of health costs of war, and in some conflict settings accounts for a significant proportion of mortality.^{13,16–18} In conflict and humanitarian settings where mass population displacement has occurred, spread of disease causes greater harm than simply the disease itself.⁵ Case in point includes the Ebola virus disease epidemic in the Democratic Republic of the Congo where directed attacks against medical personnel severely hampered disease mitigation efforts and contributed to high transmission and fatality rates.¹⁹

The current COVID-19 represents what may be a harbinger of a future of international public health challenges, the consequences of which are exacerbated by the impacts of armed conflict. Thus COVID-19 impacts illustrates how a disease can significantly worsen the international containment of a disease as responses are severely constrained by state insecurity, political instability, terrorism, repression, rights abuses and displacement of citizens.^{5,6}

Immediate and intergenerational consequences are not limited to the outbreak or public health ramifications itself, but include environmental determinants of health impacted by conflict, such as destruction of homes, congestion and inadequate sanitation, community fragmentation, homelessness, poverty and poor nutrition, all of which compromise individual and community resilience and health protective behaviours.^{12–14,20}

By way of a current example of these issues, it is instructive to look at what is currently taking place in the Yemen where its health system is crumbling after years of conflict, and the response to COVID-19 is crippled as a result.²¹ A myriad of factors compound any mitigation response. Restrictions on foreign intervention and blockade of World Health Organization containers in ports has led to medical supply (oxygen, essential medicines, personal protective equipment or PPE, testing kits) shortages and severely inadequate testing capacity.²² There is further a lack of sufficient medical personnel and coverage of operative health centres.²² From late July 2020, the Houthis ceased all social distancing and announced the virus was not a threat. Widespread community transmission is likely, with under-reporting of cases and deaths, a result of denial on the part of the Houthis and the poor recording that has resulted from the disruptions caused by the conflict.²³ The UN has warned that COVID-19 in Yemen is 'likely to spread faster, more widely and with deadlier consequences than almost anywhere else.'²² Scape-goating of migrant groups, antimigrant rhetoric and stigma impede help-seeking for those who contract COVID-19. Yemen is also on the brink of full-scale famine,²² and amid escalation of conflict and multiple disease outbreaks of diphtheria, cholera and chikungunya, COVID-19 cases and fatalities are surging.²¹ Many come to hospital in late stage disease, with reports of burials in secret. There are reports of hospital staff working without PPE, and refusing entry to those with fever and respiratory symptoms with many citizens dying at home.²¹ A ceasefire was announced by the Saudi backed coalition due to COVID-19, however fighting continues.

International humanitarian law (IHL) was first established in 1864 with the establishment of the Convention for the Amelioration of the Condition of the Wounded in Armies in the Field, the first of what became known as the Geneva Conventions.²⁴ It can be enforced by the International Court at the Hague, individual nation States and the UN. It is often monitored by the International Committee of the Red Cross, which can also enforce its provisions.²⁴

IHL is generally agreed to have been founded in 1948 with the international adoption of The Universal Declaration of Human Rights (UDHRs) through the UN. It lays down a range of enforceable obligations on States in terms of how they should treat their citizens.²⁵ Enforcement of IHL is an obligation of signatories at the State level. In circumstances where there is a failure to enforce IHL at the State level, there are regional bodies (for example within Europe the Council of Europe) and internationally through the UN. However, it should be noted, that enforcement only applies to States who are signatories to UDHR.

IHL and IHRL are complimentary to one another and, among the many issues that each covers, are leveraged to ensure and advance human health needs in conflict.⁵ IHL provides a framework regarding assurance of protection and respect for healthcare facilities, medical personnel, medical vehicles, the wounded and sick in both international and non-international armed conflicts.⁶ IHL principles of 'civilian immunity' and 'distinction' strive to ensure that civilians are never a deliberate target of attacks. Parties to a conflict, under IHL, must distinguish between combatants and civilians at all times. In so doing, they are required to ensure that all feasible precautions are taken not to harm civilians and minimise casualties amongst the non-combatant population.²⁶

IHL focuses on the protection of health in armed conflicts by mandating that all parties in the armed conflict; 'ensure that

adequate medical care is provided [without discrimination] to [the wounded and sick] as far as practicable and with the least possible delay.’²⁷ This implies that all parties are obligated not to cause serious harm to the wounded and sick (war crime), deny medical treatment (cruel or inhumane treatment) impede medical care to the wounded and sick, and protect medical professionals working in the conflict zone.⁵ Protection measures have broadened in scope, including attempts to subvert medical ethics.⁶

Assurance of the right to health (and access to healthcare) during a pandemic, such as COVID-19, is crucial in this regard. Both IHL and IHRL overlap in terms of rights to health and well-being; however, IHRL applies to all situations, with the exception of derogated rights (that is rights which a nation State specifically reserves to itself). On the other hand, IHL applies equally to both international and non-international armed conflict and governs the conduct of State and non-State actors, and situations. According to the ICRC; ‘in principle, IHRL applies at all times, unless States decide to derogate from it.’ All actors therefore are obliged to respect the right to health (see International Covenant on Economic, Social and Cultural Rights [ICESCRs]).

Protection offered by IHL goes further than specific provisions pertaining to health and health services. It also includes norms which indirectly contribute to assurance of the right to health, for example, the rules governing means and methods of warfare.²⁸ These can translate into specific international actions, for example, the protection of healthcare workers in areas of armed conflict, as outlined in UN Security Council (UNSC) Resolution 2286. Resolution 2286 mandates that where delivery of medical assistance to people in need is obstructed by parties in armed conflict, such instances should be reported to the Security Council.²⁹ However, these resolutions seem in effect to be unenforceable at the time a conflict is taking place³⁰ and are limited in terms of post-conflict enforcement depending on which State or non-State actors are referenced to Great Power rivalries.³¹ For example, within the UN the threat or exercise of a veto by permanent members of the UNSC can frustrate enforcement of IHL.²⁹ A case example in this regard is the conflict in Syria, whereby in 2017 Russia and China vetoed a Security Council Resolution to impose sanctions on parties involved in the conflict found to be using chemical weapons.³² Indeed, Russia has exercised its veto eight times on the Security Council since the conflict broke out in Syria in relation to IHL-related resolutions. It should also be noted in this context that Russia itself is a significant actor ‘on the ground’ in the Syrian conflict.

The degree to which Great Powers such as the USA, Russia and China can either be pressured into complying with IHL or refrain from protecting their proxies from the consequences of breaching IHL are unlikely to overcome the imperatives of their rivalries. However, one may note that the growth in the global transmission of zoonotic disease may act as a modifier to their lack of willingness to support enforcement as this relates to public health in conflict zones as a matter of national self-interest.

There is a distinct lack of international criteria with regard to standards of healthcare coverage, infrastructure and service preservation during war times. The Geneva Conventions are quiet with regard to ongoing obligations by States engaged in war to provide available, accessible, acceptable and quality health services to the civilian population during times of armed conflict.³³ This has far reaching consequences when confounded by pandemic or even localised disease outbreak conditions. Whilst IHL provides binding rules to protect access to healthcare (both State and non-State armed groups), in situations where the threshold of armed conflict is not reached, IHRL and domestic legislation applies.²⁷ Gaps centre on IHL confined to application to situations where armed conflict occurs, despite that in non-armed conflicts attacks on

medical facilities, personnel or medical vehicles, or interference with healthcare services still occurs.⁶ Even where armed conflict occurs, IHL does not fully ensure availability and access to healthcare for civilians.⁶ Further gaps in assurance pertain to the coverage and robustness of protection of healthcare services afforded by IHL.⁶ Further of note, is that except in situations of occupation, IHL is noticeably absent in terms of rights assurances to provision and continuity of healthcare for civilians and States in Art. 56 Geneva Convention IV (GC IV) that ‘the Occupying Power has the duty of ensuring and maintaining, with the cooperation of national and local authorities, the medical and hospital establishments and services, public health and hygiene in the occupied territory.’³⁴

A case in point in relation to Art. 56 GC IV is its violation by Israel in relation to the Occupied Palestinian territories on the West Bank of the River Jordan and the unoccupied but blockaded Palestinian territory of the Gaza Strip. Tensions between security and restricted movement leaves the Palestinian population at enormous risk in relation to the COVID-19 pandemic.^{20,35} The targeted blockade of Gaza of both ‘dual purpose’ materials and medical supplies by Israel and Egypt since 2006 have led to a significant public health crisis there. Imposition by Israel of severe limitations on freedom of movement in the Occupied Territories ensure limited access to medical help outside of the territories, leading to significant concerns in relation to pandemic spread and response.³⁵ At no point has Israel been brought to account in relation to these health rights violations. Israel enjoys this immunity from censure because of the unconditional support of the United States at the Security Council of the UN.

These deficits in health rights assurances in conflict settings during the COVID-19 pandemic are very concerning. The WHO describes health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.’³⁶ The UDHR states that ‘Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing and medical care.’³⁷ The right to medical care is further provided under UDHR Article 25.²⁷ Of note however is that the UDHR does not refer to war except to assert that prevention of war is underpinned by respect for human rights.³³ The General Comment 14 Committee on Economic, Social and Cultural Rights (CESCRs) is silent on armed conflict, with the exception of reference to IHL and the requirement for humanitarian assistance in conflict.³³

IHRL by virtue of the right to health attempts to fill these identified gaps by supporting access to healthcare which includes measures to prevent and treat infectious disease in conflict settings.³⁸ A human rights approach to countering COVID-19 during armed conflict conditions can further support a viable route to ensuring health rights are honoured, particularly based on a normative framework where States are obliged to respect, protect and ensure a right to health for all across all conflict settings as enshrined in General Comment No. 14 CESCRs. This contains the core and non-derogable core obligations regarding maintenance of essential health services including primary care, access to basic needs (nutrition, shelter, housing, safe water, sanitation) and provision of essential medicines; see also Article 12 of the ICESCRs, and the International Covenant on Civil and Political Rights; ICCPRs.^{6,27,39,40} Additional protection measures in IHRL during times of conflict and health emergency are based on fundamental rights for combatant and civilian entitlements (for example anti-discrimination provisions; prohibition of torture).^{6,39,40}

Formal obligations of state actors within armed conflict

A pandemic disease emergency, such as COVID-19, is life-threatening. Leaving both the citizen and combatant population exposed to such a disease is a human rights breach and constitutes an indirect method of warfare; with neglect by State actors

potentially constituting breach of the universal right to life. Principles of warfare whilst referring to means and methods of warfare itself, include the impacts of weapons on the health of combatants and the indirect effects on civilians.²⁸ For example it is prohibited to use famine, pillaging or poisoning of water as a weapon of war.²⁸ Under Article 6 ICCPR States are obliged not to subject any individuals under their jurisdiction or control to arbitrary deprivation of life; and with individuals also having a right to security under Article 9 ICCPRs. General Comment No. 6 of the Human Rights Committee of the UN further states that the right to life contained in ICCPRs enshrines a State obligation to implement positive measures, including those to ensure health care, particularly in life-threatening-circumstances.

With regard to public health and applicable to contagious disease, Article 12 ICESCR specifically refers to the non-derogable State responsibility to protect all from contagion; in the *'the prevention, treatment and control of epidemic, endemic, occupational and other diseases'* and *'the creation of conditions which would assure to all medical service and medical attention in the event of sickness'*.⁴¹ IHL Art. 56 GC IV further requires States, *'to the fullest extent ... adopt the prophylactic and preventive measures necessary to combat the spread of contagious diseases and epidemics'*.^{27,34} Of note is that whilst Article 4 ICESCR permits States to place restrictions on right to health, this must occur in compliance with human rights standards and rights; be in the interest of legitimate aims, and only when necessary for promotion of general welfare in a democratic society (see General Comment No. 14 CESCR).²⁷ Definition of democratic is problematic given that possibly up to half of State actors currently are either semidemocratic or not democratic. Neglect of disease mitigation measures during conflict is certainly not permissible during a global pandemic.

Tackling environmental determinants of health, and help-seeking for testing, tracing and care are crucial to prevent community transmission. Whilst right of access to health services is not an absolute right State obligations to ensure sufficient, equitable and non-discriminatory access to healthcare; based on sanitary and social measures to support effective access to restore and maintain health include applicable disease control measures such as vaccination, medical care, access to nutrition, and adequate sanitation and hygiene (ICESCR, Articles 2.2., 3, 12, 24; International Convention on the Elimination of All Forms of Racial Discrimination, Article 5; the Convention on the Elimination of All Forms of Discrimination Against Women, Articles 10, 12, and 14; the Convention on the Rights of the Child, Article 24).²⁸

Non-discriminatory measures further ensure States cannot prevent medical personnel from treating wounded and sick individuals (General Comment No. 14 CESCR) founded on the principle of medical neutrality during an armed conflict; *'which guarantees the provision of healthcare without discrimination to all injured and sick combatants and civilians in time of conflict'*.^{27,42} Where discrimination of people with COVID-19 symptoms or minority groups at the point of access to health facilities occurs (for example as in Yemen) this further breaches the principle of medical neutrality.

Disease control is an arm of State public health obligations.^{6,34,43} In this regard General Comment No.14 (CESCR) right to health specifically declares that States cannot justify their failures to mitigate disease based on claims of lack of resources. Even when resources are minimal, a State is obligated to maximise its efforts to uphold the right to health. IHL obligates States to ensure required humanitarian assistance is provided, facilitate receipt or transit of humanitarian aid to the civilian population in need and operationalise programmes which target and support most marginalised and vulnerable populations in a conflict zone.²⁷ Whilst the party in receipt may take steps to control the humanitarian aid

(content and delivery) to ensure the aid does not include weapons, the deliberate blocking of relief supplies is prohibited.²⁶ Refusal is considered arbitrary when the consequences violate international law regarding the rights of civilians, exceed what is necessary to achieve ends sought in withholding permission, are disproportionate, or result in injustice, an unpredictable outcome or are deemed inappropriate.⁴⁴ IHL further mandates that humanitarian staff are permitted to sufficient freedom of movement for their function, and may only be restricted temporarily due to military requirements, for example security concerns.²⁶ As our earlier example relating to Israel and the Occupied Palestinian Territories illustrate, however, these requirements can and are flouted because of lack of enforcement.

Conclusion

The COVID-19 pandemic has shone a spotlight on State obligations to ensure population rights to health during armed conflict. The right to health is increasingly used to challenge discriminatory and inequitable health care in conflict settings.^{5,33} The fulfilment of that right is further underpinned by State obligations to maintain an operable healthcare system, ensure adequate food and medical supplies, and implement public health measures to protect all from disease.¹ The urgent COVID-19 response and vaccination roll out may offer a viable route to leverage for greater access and coverage of health care in conflict and humanitarian settings. At the time of writing, ICRC estimates that more than 60 million people residing in conflict zones controlled by non-State armed groups are at risk of exclusion from national COVID-19 vaccination programmes despite country sign up to the global COVAX initiative. Before COVID-19, the UNSC adopted Resolution 2286 calling for an end to attacks on healthcare.^{45,46} This is an imperative now given the continued and growing impact of COVID-19 contagion. It is a harbinger of future and possibly even greater international disease spread challenges the spread of which may be promoted through armed conflict unless the urgent need for people to access healthcare for testing and treatment is not addressed and enforced. Efforts to counter impeded access to healthcare must continue, to prevent community transmission, contain outbreaks, and reduce the severity of mortality and morbidity associated pandemics such as COVID-19. In this sense, the right to health must compel State and non-State actors involved in conflict to provide disease mitigation measures to protect medical personnel and citizens, spanning PPE, testing, and State provision of essential medicines (including drugs to treat and vaccinate). Conflict-epidemiology^{16,28,47} cannot be underestimated in assuring deployment of adequate COVID-19 disease responses via State and humanitarian actors, and continued resource prioritisation. A radicalised partnership approach during these times of emergency is warranted, based on an ethical *'humanitarian intervention'*²⁸ approach to provide care to all affected by contagious disease in conflict settings.

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