

City Research Online

City, University of London Institutional Repository

Citation: Zhu, N., Ferlie, E., Castro-Sanchez, E., Birgand, G., Holmes, A. H., Atun, R. A., Kieltyka, H. & Ahmad, R. (2021). Macro level factors influencing strategic responses to emergent pandemics: a scoping review. Journal of Global Health, 11, pp. 1-16. doi: 10.7189/jogh.11.05012

This is the supplemental version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/25823/

Link to published version: https://doi.org/10.7189/jogh.11.05012

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

City Research Online: http://openaccess.city.ac.uk/

publications@city.ac.uk

Online Supplementary Document

Table S1. Scoping review search strings

```
Strings for PubMed:
Search 1:
((situation analysis[Title/Abstract]) OR (situational analysis[Title/Abstract]) OR (strategic
analysis[Title/Abstract]) OR (SWOT[Title/Abstract]) OR (PESTELI[Title/Abstract]) OR (PESTELI[Title/Abstract]) OR
(STEEPLE[Title/Abstract])) OR (PEARLES[Title/Abstract])
((pandemic*[Title]) OR (epidemic*[Title]) OR (outbreak*[Title]))
Search 2:
((preparedness*[Title]) OR (planning[Title]) OR (response*[Title]) OR (control[Title]) OR (mitigate*[Title]) OR
manag*[Title])
AND
((facilitat* [Title/Abstract]) OR (inhibit*[Title/Abstract]) OR (influenc*[Title/Abstract]) OR
(correlate*[Title/Abstract]) OR (determinant*[Title/Abstract]) OR (predictor*[Title/Abstract]) OR
(barrier*[Title/Abstract]) OR (contribut*[Title/Abstract]) OR (driv*[Title/Abstract]))
AND
((anthropolog*[Title/Abstract]) OR (socio*[Title/Abstract]) OR (social*[Title/Abstract]) OR
(politic*[Title/Abstract]) OR (economic*[Title/Abstract]) OR (technolog*[Title/Abstract]) OR
(ecolog*[Title/Abstract]) OR (environment*[Title/Abstract]) OR (legislati*[Title/Abstract]) OR
(law*[Title/Abstract]) OR (regulat*[Title/Abstract]) OR (industr*[Title/Abstract]))
((pandemic*[Title]) OR (epidemic*[Title]) OR (outbreak*[Title]))
Limit: 2000-current
Limit: English only
Strings for Ovid databases:
Search 1:
1. (situation analysis or situational analysis or strategic analysis or SWOT or PESTEL or PESTELI or STEEPLE or
PEARLES).ab. and (pandemic* or epidemic* or outbreak*).ti.
2. limit 1 to English language
3. limit 2 to yr = "2000-Current"
Search 2:
1. (((prepare* or planning or respon* or control* or mitigate* or manag*) and (facilitat* or enabl* or inhibit* or
influenc* or correlate* or determinant* or predictor* or barrier* or contribut* or driv*) and (anthropolog* or
```

socio* or social* or politic* or economic* or technolog* or ecolog* or environment* or legislati* or law* or regulat* or industr*)).ab. and (pandemic* or epidemic*).ti.) not (diabet* or asthma or opioid* or obes* or HIV or malaria or tuberculosis).ti.

- 2. limit 1 to english language
- 3. limit 2 to yr = "2000-Current"

 Table S2. Facilitators and inhibitors in pandemic management identified in individual studies

(a) COVID-19

	Political (P)	Economic (Econ)	Sociological (S)	Technological (T)	Ecological (E)	Legislative (L)	Industry (I)
				COVID-19			
	Facilitators						
(21)	Enactment of emergency policies and decrees					Banned air traffic from China; mandatory reporting of travel history to the Italian National Health Service (NHS); mandatory quarantine	Rapid response including increased healthcare human resources capacity and protected supply chains
(21)	Inhibitors						
	Inconsistency between local and national guidance in technical orders and clinical protocols			Constraints in data integration and smart technologies to support contact tracing, surveillance, and other interventions			
	Facilitators						
(22)				Health informatics technologies (e.g. big data for tracking and tracing; 5G network for telemedicine; artificial intelligence for rapid, precise diagnostics); regulation of travelling using QR code of health record			High internet coverage and utilisation
(22)	Inhibitors						
				Lack of rapid deployment of information systems; suboptimal information exchange across heath institutions; nonstandardised electronic health records to streamline emergency information			
	Facilitators	ı				T	
(25)							
	Inhibitors						

	Lack of public knowledge		
	resulted in continuation of		1
	mass gatherings		1

(b) Ebola

	Political (P)	Economic (Econ)	Sociological (S)	Technological (T)	Ecological (E)	Legislative (L)	Industry (I)
				Ebola			
	Facilitators						
	Political commitment contributed to a rapid/effective response in some countries (e.g. Nigeria) Inhibitors		Inadequate self-prescribed infection preventative measures due to poor health education; poor housing		High prevalence of nosocomial infections;		
(27)		Poor healthcare system financing	conditions in rural areas; poor safety orientation (training) in hospitals; low adherence to government regulations in rural areas despite public campaigns; re-infection due to risky sexual behaviours; lack of follow-up with recovered cases and long-term monitoring; culture and tradition (e.g. mass gathering at funerals)		climate conditions increasing transmission; deforestation; physical proximity between human and wildlife, including animal reservoirs (e.g. fruit bats); zoonotic pathogens transmitting across species; low vaccination due to misinformation on mass media	Cross-border transmission due to relaxed immigration policies	Inadequate drug and PPE supply; staffing limitation due to transmission among HCWs
	Facilitators						
	Inhibitors						
(23)	contact tracer recruitment and organisation led by non- health institutes)		Rejecting contact tracing due to stigma and fear, and/or to avoid quarantine; inadequate training of contact tracers; lack of support to quarantined citizens	Incomplete case monitoring database			Lack of appropriate equipment for contact tracers; heavy workload due to shortage of contact tracers
(24)	Facilitators						

Declaration of national emergency (e.g. Nigeria); demonstration of political commitment (e.g. HCWs and non-clinical staff in hospitals demanding full attended by Minister of Health, State Governors and their Commissioners in Nigeria); national weekly briefings to provide up-to- date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
demonstration of political commitment (e.g. HCWs and non-clinical staff in hospitals demanding full attended by Minister of Health, State Governors and their Commissioners in Nigeria); national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
commitment (e.g. Presidential Summit attended by Minister of Health, State Governors and their Commissioners in Nigeral; national weekly briefings to provide up-to- date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Presidential Summit attended by Minister of Health, State Governors and their Commissioners in Nigeria); national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
attended by Minister of Health, State Governors and their Commissioners in Nigeria); national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Health, State Governors and their Commissioners in Nigerial; national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Health, State Governors and their Commissioners in Nigerial; national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
their Commissioners in Nigeria); national weekly briefings to provide up-to-date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWS who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Nigeria); national weekly briefings to provide up-to- date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
briefings to provide up-to- date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
date information, and dispel fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
fears, rumours and misconceptions Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Inhibitors Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
Stigma and discrimination against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
against patients and HCWs who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
who treated them and subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
subsequent actions (e.g. protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
protests near treatment centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
centres due to lack of knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
knowledge, fear, and misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
misinformation on mass media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
media (e.g. Ebola infection is incurable); low willingness among HCWs to join the
incurable); low willingness among HCWs to join the
among HCWs to join the
from the state from the first term to the first
front line due to fear; low
confidence in the capacity of
health system and
leadership to provide
reliable information and
resources for infection
prevention prevention
Facilitators
Deployment of foreign
HCWs, as aids from allies, Countries with trading
maintain global balance of partners are more likely to
political power; nistorical act early to protect trade. Media coverage and public
choices and policies facilitate and prevent contagion: attention facilitate
(28) Institutionalised capacities securing important inputs humanitarian assistance and
and norms for civil for domestic industries or HCW deployment
emergency management, output markets motivate
Toreign medical aid, or HCW deployment abroad
overseas military personnel
deployments
Inhibitors

Contests between powerful domestic actors delaying crisis response; organisational limitations, cognitive barriers and political construction of threat perception in policy makers may lead to hesitation in HCW			Deployment of HCWs can be delayed if industry interdependence exists, such as logistical planning, medical evacuation, and other necessities
deployment			

(c) Influenza A (H1N1)

	Political (P)	Economic (Econ)	Sociological (S)	Technological (T)	Ecological (E)	Legislative (L)	Industry (I)
				Influenza A (H1N1)			
	Facilitators						
	External funds through the						
	Partnership Contribution			Vaccination coverage; early			
	(PC) of pandemic influenza preparedness (PIP)			initiation of antivirals			
	Inhibitors						
(32)	Inadequate preparedness plans lacking detailed strategic review and assessment		The annual Islamic pilgrimage (Hajj) driving transmission; population displacement and migration due to ongoing wars and conflicts	Lack of complete surveillance systems across national, sub-national and regional level; absence of integration between animal and human surveillance networks	Global migratory bird flight increasing transmission of Avian influenza through wild birds, poultry and humans	Absence of legal framework (for declaring emergency and taking actions) in pandemic planning	Shortage in trained staff and laboratory equipment for surveillance; lack of planning for procurement, storage and distribution of vaccines; low utilisation of research and evaluation to revise preparedness plans and improve prevention and containment measures
	Facilitators						
(33)			Public knowledge (e.g. knowledge in transmission mechanism, how to infection control measures; efficacy and effectiveness of control measures); optimal perception of severity and vulnerability of the infection				
	Inhibitors						

	1	T				T	T
			Anxiety and fear				
	Facilitators	l				l	
	Arrangement and strength in governance and stewardship Inhibitors			Technologies available for surveillance, case detection, and infection control	Existing epidemiological profile of high life expectancy and low mortality		External resources available for LMICS (e.g. Laos, Cambodia)
	innibitors	T				T	61 , 6 , 116 , 11
		Insufficient budget for pandemic preparedness; reliance on external funding	Lack of public health education specifically for Influenza A (instead focusing on Avian influenza)				Shortage of qualified human resources restricting surveillance and response capacity
	Facilitators	•	·				
			Optimal knowledge in the influenza pandemic; having a health-related personal				
			network (<i>e.g.</i> having family or friends who can provide				
(26)			health-related information				
(20)			or support)				
	Inhibitors						
			Low education;				
			unemployment and low				
			socio-economic position				
			associated with inadequate access to health information				
	Facilitators		access to ficular information				
			Adherence with antiviral				
1			medication (either as				
			prophylaxis or treatment)				
			associated with previous				
			compliance with other				
(25)			precautionary advice about				
(35)			pandemic flu, beliefs that the recommended				
			preventive measures were				
			necessary; having discussed				
			the option of taking antiviral				
			medication with someone				
			who had not experienced				
			side effects				

	Inhibitors	
	IIIIIIIIIIIII	Non-adherence with
		ntiviral medication due to
		experienced or perceived
	ad	lverse effects, not wanting
		to take medication,
	for	rgetting, losing, or running
		out of tablets
	Facilitators	
	Inhibitors	
		Social stigma and
	dis	scrimination against one or
		nore particular social sub-
		group (s); lack of trust in
		overnment's capacity and
		sirness when handling the
		mergence; inequalities in
		exposure to public health
(36)		ommunication messages,
		which led to negative
		outcomes, including low
		accine uptake; inadequate
		knowledge, attitude, and
		eliefs about the pandemic,
		suboptimal care seeking
		pehaviour; low ability and
		willingness to seek and
	p	process information; poor
	P Wasan	emotional responses
	Facilitators	
		Perception of benefits of
		accination (e.g. protecting
	l th	nemselves and loved ones,
		protecting patients);
		adequate perception of
		susceptibility (e.g. risk of
(37)		infection, immunity via
		previous exposure) and
		everity; responsive action
	to	o information from mass
		media, public health
		authorities, and co-
		workers/supervisor
	Inhibitors	

	14 1 1 1		
	Vaccine hesitancy among		
	HCWs due to concerns in		
	vaccine safety, adverse		
	effects,		
	effectiveness/efficacy)		

(d) Multiple pandemics

	Political (P)	Economic (Econ)	Sociological (S)	Technological (T)	Ecological (E)	Legislative (L)	Industry (I)
				Multiple pandemics			
	Facilitators						
(38)	Policies to define CHW tasks and roles; stakeholder engagement in governance arrangements	Sustained investment in CHWs (e.g. financial incentives remote area allowance, performancebased financing payments or accommodation); additional resources to support the wellbeing of CHWs during and post pandemic	Appropriate CHW training; organised and funded wellbeing support to CHWs; community engagement to enhance social mobilisation, build trust and increase service utilisation; transparency in communication mitigated fears	Information management systems and digital health technology employed for CHW programmes	Improved vaccination coverage with as an outcome of CHWs' regular household visits, liaising with poultry and feed sellers at marketplace		Adequate PPE supply to CHWs
	Inhibitors						
	Lack of a priori pandemic communication plan			Non-functional surveillance systems due to delayed reporting from health facilities; contact tracing potentially hamper primary service delivery			Disruption in drug and equipment supplies common during pandemics; lack of research in equity, gender equality, and economic evaluation of CHW programmes
	Facilitators						
(39)			Community palliative care to support people who prefer to remain at home towards end of life; re-deployment of volunteers to provide psychosocial and bereavement care; support carers to deal with stress	Volunteers transitioned to become virtually deployed			
	Inhibitors						

	1				
	Delayed, poor coordination of hospital level policies and protocols and hospice- specific guidance	Ethical challenges concerning allocation of scare resources	Lack of data collection systems to understand patient outcomes and share learnings		Lack of material supplies (e.g. PPE, diagnostic and monitoring equipment)
	Facilitators				
	Collaboration between				
	governmental agencies and				
	external organisations (e.g.				
	the CDC and WHO)				
	Inhibitors				
(29)					Lack of integration of
, ,					internet and related
			Low adoption of remote	Fast transmission due to	technologies for surveillance
			medical assistance to detect	environmental change and	activities (e.g. simultaneous
			and control zoonotic infectious disease outbreaks	international travel via	reporting and monitoring,
			infectious disease outbreaks	railway and air way	end-to-end connectivity, data assortment and
					analysis, tracking and alerts)
	Facilitators				unarysis, trucking und dicres,
	- demeators		Pathogen discovery		
			techniques; meta-genomic		
			technology to predict		
			pandemic potential in novel		
(20)			microbes		
(30)	Inhibitors				
				Juxtaposition of livestock	
				production and wildlife	
				populations; change in land	
				use related to development	
				of tropical forests	
	Facilitators				
(24)	Credibility of evidence				
(31)					
	healthcare system capacity				
	Inhibitors				

priorities	Confusion in attribution of responsibility (e.g. healthcare system or the general public?); lack of coordination in responses among agencies due to competing causal explanations of the pandemic and conflicts in	Economic inequalities in social sub-group(s)	Globalisation accelerating transmission; culture (e.g. traditional burial practices, dietary habits such as consumption of bush meat, blaming and social stigma)	Inadequate case reporting due to lack of information technologies			
------------	--	--	--	---	--	--	--