

A Coordinated National Roadmap for COVID-19 Research

Executive Summary and Appendices

Essential National Health Research Committee Ministry of Health and Wellness, Jamaica

Abbreviations

ARI Acute Respiratory Infection

BIREME Latin American and Caribbean Center on Health Sciences Information

BOJ Bank of Jamaica

CAIHR Caribbean Institute of Health Research

CARIMAC Caribbean School of Media and Communication

CARPHA Caribbean Public Health Agency

COVID 2019 Coronavirus Disease 2019

DNA Deoxyribonucleic Acid

ESRD End Stage Renal Disease

ELISA Enzyme-Linked Immunosorbent Assay

ENDEAVOR Emerging and Novel Drug trEAtment for COVID infectiOns Research

ENHRC Essential National Health Research Committee

EOC Emergency Operation Centre

HCW Health Care Worker

HSRWG Health Systems Research Working Group

HIV Human Immunodeficiency Virus

HMSR Hospital Monthly Statistical Report

IgG Immunoglobulin G

IgM Immunoglobulin M

ILI Influenza-Like Illness

IS4H Information Systems for Health

IS4H- DMP Information Systems for Health Data Management Policy

JAMPRO Jamaica Promotions Corporation

KAP Knowledge Attitudes and Practices

LFS Labour Force Survey

LRTI Admitted Lower Respiratory Tract Infection

MCSR Monthly Clinic Summary Reports

MERSCoV Middle Eastern Respiratory Syndrome Coronavirus

MICAF Ministry of Industry, Commerce, Agriculture and Fisheries

MHS Multi-Purpose Household Survey

MLSS Ministry of Labour and Social Security

MOFPS Ministry of Finance and the Public Service

MOHW Ministry of Health and Wellness

MOEY Ministry of Education, Youth and Information

MSET Ministry of Science, Energy and Technology

MTF Medium Term Socio-Economic Policy Framework

NCD Non Communicable Diseases

NCU Northern Caribbean University

NFPB National Family Planning Board

NHF National Health Fund

NK Cells Natural Killer Cells

NP Nasopharyngeal

OPM Office of the Prime Minister

PAMP Pathogen Associated Molecular Patterns

PPE Personal Protective Equipment

PCR Polymerase Chain Reaction

PAHO Pan American Health Organization

PIOJ Planning Institute of Jamaica

PPP Public Private Partnership

RDK Rapid Diagnostic Kit

RCT Randomised Controlled Trial

RDT Rapid Diagnostic Test

RNA Ribonucleic Acid

SALISES Sir Arthur Lewis Institute for Social and Economic Studies

SARI Severe Acute Respiratory Illness

SARS-CoV Severe Acute Respiratory Syndrome Associated Coronavirus

SARS-COV-2 Severe Acute Respiratory Syndrome Coronavirus 2

SDG Sustainable Development Goals

SLC Survey of Living Conditions

STI Sexually Transmitted Infections

STATIN Statistical Institute of Jamaica

SRH Sexual and Reproductive Health

TAJ Tax Administration Jamaica

TLD Tenofovir, Lamivudine and Dolutegravir

UHC Universal Health Coverage

UTech University of Technology

UWI University of the West Indies

UWISON UWI School of Nursing

VHL Virtual Health Library

WG Working Group

WHO World Health Organization

1.0 Executive Summary

1.1 Introduction

Viral respiratory diseases such as influenza have always had the greatest potential to cause pandemics, and this has been borne out historically. The first cases of coronavirus disease were identified in Wuhan, China in December 2019.¹ The pathogen, a single-strand RNA beta-coronavirus,¹ was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2),¹ ² and the resultant disease was called coronavirus disease 2019 (COVID-19).² Coronaviruses are diverse, resulting in infections which may cause mild to severe forms of disease in humans.² Other beta-coronaviruses, namely SARS-CoV and MERSCoV, have resulted in high mortality rates of 10% and 35% respectively in other settings.²

The Coronavirus disease outbreak has quickly grown from a localized issue in China, to a public health challenge in approximately two hundred countries and territories. The World Health Organization declared coronavirus disease a public health emergency of international concern on January 30, 2020, and the COVID-19 outbreak was characterized as a pandemic on March 11, 2020³. As at April May 14, 2020 there were 4,248,389 cases and 294,046 deaths confirmed globally⁴. The first case of coronavirus disease in Jamaica was confirmed on March 10, 2020.

Despite the global spread and breadth of cases, much remains unknown regarding the disease. This includes but is not limited to: (a) the proportion of pre-symptomatic individuals as well as asymptomatic cases in the population,⁵ (b) the spectrum of disease severity and risk factors for severe illness and death.⁶ (c) the level of co-infection,⁵ (d) the period of infectiousness and transmissibility, ⁶ (e) the extent of viral shedding in the population,⁵ (f) the level of survival of the virus outside the body,⁶ (g) the efficacy of antiviral drugs and other treatments² and (h) the validity of serological and other tests.⁶ The evaluation of the success of quarantine strategies and their acceptability⁶ will also be important. It will also be critical to evaluate the level of responsiveness of the health system to the outbreak, and assess the impact on the economy and on various sectors.

The Essential National Health Research Committee (ENHRC) of the Ministry of Health and Wellness (MOHW) has begun to formulate a national coronavirus disease research agenda to provide data to guide the COVID-19 outbreak response. This document introduces the agenda, while outlining the budget and timelines for implementation.

1.2 Purpose

The purpose of the COVID-19 Research Roadmap is to provide an integrated framework to guide the coordination, implementation and utilization of research pertaining to COVID-19 to inform the national response in the mitigation and/or management of the current outbreak and future activities

1.3 Objectives

The objectives of the National COVID-19 Research Agenda are to:

- 1. Support the generation of evidence needed to strengthen clinical management, public health guidance and actions essential for mitigating the impact of COVID-19 disease on the population of Jamaica
- 2. Determine the impact of COVID-19 on various sectors in Jamaica to provide information for action
- 3. Coordinate efforts across Government, academia, the private sector, development partners and other stakeholders to optimize research efforts and outcomes in a 'whole-of-society' response to producing data.
- 4. Support the development of the research for health enterprise to be better prepared for the next emerging and re-emerging disease outbreak.

1.4 Governance

The development of a National COVID-19 Research Agenda will be the responsibility of the ENHRC, a Chief-Medical Officer appointed Committee currently led by Dr. Karen Webster-Kerr, Principal Medical Officer and National Epidemiologist. Membership is comprised of key stakeholders in research, including representatives from the Ministry of Health and Wellness, educational institutions, the Pan American Health Organization (PAHO), the Caribbean Public Health Agency (CARPHA), the Planning Institute of Jamaica (PIOJ), the Statistical Institute of Jamaica (STATIN), the Registrar General's Department, professional associations and non-governmental organizations. The National COVID-19 Research Agenda is co-chaired by the MoHW and the STATIN.

The development of a National COVID-19 research agenda will be achieved through the establishment of Research Working Groups covering six areas. These are: (1) Clinical and Laboratory; (2) Epidemiological/Surveillance: Case and Control; (3) Epidemiological Surveillance: Household and Community; (4) Health Systems; (4) Socioeconomic; (5) Communication and (6) Policy. A seventh cross-cutting Data Management and Documentation group will also be established. Research Working Groups are outlined in Table 1 and their membership detailed in Appendix 1.

Working groups will be responsible for identifying and prioritizing research under thematic areas, and will provide guidance in the execution of research. As an initial step, Terms of References (TOR) for the Working Groups will be developed to clarify membership, roles and functions, tenure and reporting requirements.

Table 1: COVID-19 Research Working Groups

Research Working Group	Chairperson	Co-Chairperson(s)
Clinical and Laboratory	Prof. Marvin Reid	Dr. Naydene Williams
		Dr. Michelle Hamilton
Epidemiological/Surveillance	Case and Contact	

Research Working Group	Chairperson	Co-Chairperson(s)	
	Dr. Jacqueline Duncan	Dr. Iyanna Wellington	
	Household and Community		
	Prof. Affette McCaw-Binns	Dr. Ardene Harris	
		Dr. Kelly-Ann Gordon-Johnson	
Health System	Dr. Georgiana Gordon-Strachan	Mr. Jasper Barnett	
Socio-Economic	Ms. Leesha Delatie-Budair	Mr. James Stewart	
		Dr. Kelly-Ann Dixon-Hamil	
Communication	Dr. Althea Bailey		
Policy	Mr. Howard Lynch		
	CROSS-CUTTING		
Data Management and	Dr. Maurice McNaughton	Dr. Beverly Lashley	
Documentation		Mrs. Vinnese Dias	

1.5 Methodology

The ENHRC convened weekly meetings of research working groups to discuss i) the approach to be taken (ii) the definition of objectives and (iii) the prioritization of research topics. Working groups were asked to prepare a brief on the research to be conducted under each thematic area. Weekly meetings held on April 10 and 17 were used to present research priority areas to the wider ENHRC and to obtain feedback from peers.

The Ministry requested technical and other support from the Pan American Health Organization (PAHO) in the conduct of early investigations regarding COVID-19. These include investigations related to the first few COVID-19 cases and contacts and household transmission, which fell under the remit of the *Epidemiological/Surveillance: Case and Contact* Research Working Group. Support was also requested for a sero-epidemiological survey to be conducted by the *Epidemiological Surveillance: Household and Community* group. These studies utilized protocols developed by the PAHO/World Health Organization (WHO) to allow for standardization of data collection across WHO member states.

Research working groups prepared proposals as well as a budget and timeline for activities.

1.6 Towards a Coordinated Research Roadmap for COVID-19 in Jamaica

The Coordinated Research Roadmap for COVID-19 entails the identification of research priority areas that the government will fund and support. The full Agenda is listed in Table 3. Research Working Groups have identified immediate research actions (Table 2), as well as those that should be undertaken in the short, medium, and long term (Table 8). Funding to support some immediate research initiatives will be taken from internal budgets of Ministries, Departments and Agencies. However, the Government of Jamaica will be asked to approve an overall budget for the National COVID-19 Research Agenda to ensure that critical research initiatives are undertaken. Figure 1 outlines the activities to be undertaken and the required budget for each phase.

The following research priorities were identified for immediate action.

 Table 2: Immediate Research Actions

Research Working Group	Immediate Actions to Be Undertaken
Clinical and Laboratory	1. WHO Solidarity Trial
	2. TLD Trial
	3. ENDEAVOR Trial
	4. Test Performance Characteristics of Antibody Assay Kits
	5. Validation of Specimen types and collection methods: Self- collected Nasopharyngeal (NP) specimens, throat washings and sputum for COVID-19 compared to specimens collected by health care professionals
Epidemiological/Surveillance: Case and	1. Use of technology with self-administered tools for surveillance
Contact	of cases and contacts
	2. Analysis of existing data on cases and contacts
	3. Case control study to identify risk factors for COVID-19 infection
	4. To determine prevalence and risk factors for COVID-19 infection among HCWs
	5. Cohort study of persons with COVID-19 infection to determine
	short-term and long-term outcomes of COVID-19 infection
	6. To establish a biorepository of serum samples for cases and contacts of COVID-19 cases
Epidemiological/Surveillance: Household and	1. KAP Survey
Community	2. Validate and select a serological test for the community survey
	using sera from diagnosed cases.
	3. Sero-Epidemiological Survey
Health System	UHC: Health Service Delivery -Patient Level
Socio-Economic	1. Analyses of the impact of COVID-19 control measures on fiscal
	revenues, trade and industry
Communication	1. Case Study of quarantined communities (mixed methods)
	2. Engagement strategies for travellers3. Coping with COVID-19: the acceptability, appropriateness,
	cost, and reach of the health risk communications for
	vulnerable populations
	valuerable populations
Data Management and Documentation	Data and Information Management

1.7 Research Agenda

Table 3 outlines the National COVID-19 Research Agenda priority areas to be undertaken by each Research Working Group.

Table 3: National COVID-19 Research Agenda

Research Working Group	Priority	Sponsored/Supported
Clinical and Laboratory	1. WHO Solidarity Trial	Yes
	2. TLD Trial	No
	3. ENDEAVOR Trial	No

Research Working Group	Sponsored/Supported	
	4. Test Performance Characteristics of Antibody Assay Kits	No
	5. Validation of Specimen types and collection methods: Self-collected Nasopharyngeal (NP) specimens, throat washings and sputum for COVID-19 compared to specimens collected by health care professionals	No
	6. Viral load, biomarkers and lung function in patients diagnosed with COVID-19	No
Epidemiological/Surveillance: Case and Contact	1. To describe the first 200 cases of COVID-19 infection in an island state	Yes
	2. To determine sensitivity and specificity of case definition for COVID-19 infection	No
	3. To determine the risk factors for transmission of COVID-19 infections (behavioural etc.)	No
	To determine prevalence and risk factors of COVID-19 infection among health care workers	Yes
	5. To determine the natural history f COVID-19 infection (including short term and long term outcomes of persons with COVID-19 infection)?	Yes
	6. To establish a biorepository of serum samples for cases and contacts of COVID-19 cases	No
Epidemiological/Surveillance:	1. KAP survey	
Household and Community	2. Community sample survey	Yes
Health System	UHC: Health Service Delivery -Patient Level	No
	2. Health System Level -Resilience and Response	No
	3. Health Service Delivery- Health Provider/Government level	No
	4. Health System Leadership, Communication and Decision-Making	No
	5. Evaluation of Transformative and innovative strategies	No
Socio-Economic	Government and Public-Private Partnerships	No
	2. Business, Industry and Trade	No
	3. Society and Household	No
Communication	Case Study- Quarantined Communities	No
	2. Coping with COVID-19 the acceptability, appropriateness, cost, and reach of the health risk communications for vulnerable populations	No
	3. Community / Target audience Engagement Strategies for specific target populations	No

Research Working Group	Priority	Sponsored/Supported
Data Management and	Research Bibliography	No
Documentation	2. Data & Information Management	No
	3. Documentation	No
	4. Research initiative (Big Data sources)	No

1.8 Implications for Policy and Practice

Successful implementation of the COVID-19 research roadmap may:

1. Contribute to a greater understanding of the disease, including factors leading to the transmission of COVID-19, as well as its impact on vulnerable populations

2. Facilitate

- a more efficient and effective emergency response to pandemics, including the rapid adaptation and implementation of surveillance systems, mobilization of funding and escalation of diagnostic testing
- improved interaction between public and private health facilities including private hospitals
- improved interactions between "field" staff and facilities and the Ministry of Health
- Revised guidelines for the management of epidemics, pandemics and disasters, these will be based on the lessons learnt from our experience as a nation.
- A responsive monitoring system with triggers to show declines in the uptake/utilization of public clinical services and pharmaceuticals provided by the National Health Fund
- The development of a mathematical model for the establishment of baselines for different health services using historical data. The incorporation of the model into routine monitoring for comparisons post COVID-19
- the provision of human and other resources which can be used in future initiatives to provide data to guide interventions
- 3. Provide information on the success and acceptability of government intervention measures
- 4. Lead to a improvements in the legal aspects of pandemic preparedness and implementation of emergency response
- 5. Lead to greater understanding of the impact of the disease on sexual and reproductive health, maternal and child health, HIV/STIs and gender-based violence

1.10 Limitations

- 1. The National COVID-19 Research Agenda may not cover all areas of research related to the disease. While the Agenda will be prioritized by the Ministry of Health and Wellness, as well as other organizations represented by Research Working Groups, it is recognized that there are areas of research that may be undertaken by institutions to fulfil other important objectives.
- 2. The current COVID-19 outbreak is dynamic, and the impact of the disease may be long-term. While the Agenda outlines research to be conducted over a two-year period, all the impacts as well as ensuing research questions may not be anticipated.

Long Term (>=12 months) **Activities** Determine the natural history of COVID-19 To establish a biorepository of serum samples for cases and contacts of COVID-19 cases **Medium Term** Multi-sectoral response to service delivery in health (Ministries and international stakeholders) (6-12 months) Changes in Epi Profile **Short Term** Assessment of impact on fiscal and monetary Activities (0-6 months) policies for COVID-19 Determine risk factors for COVID-19 A review of innovative health financing models infection among health care workers **Activities** Phase 2 - end of epidemic sero-survey Post-Pandemic perspective on the role of Solidarity, TLD & Endevor clinical trials Long Term (>=1 year) persistence of government and government institutions Test performance of kits economic and social impact on the Import trends, trade policy and impact of Self-collected nasopharyngeal specimens population manufacturing and wholesale and retail trade Viral load, biomarkers and lung function Mortality trends - review of reported Description of the first 200 COVID-19 cases The Digital Economy: Reshaping the Labour Force deaths for 2020 compared to 2015-2019 Sensitivity and specificity of case definitions How has/will the pending shortage of raw materials by cause Determine the risk factors for transmission of and consumer goods impact life in Jamaica? Access to prescription drugs – diabetes COVID-19 infections and hypertension Formalization of the informal economy KAP Survey Assessment of the impact on revenue & How has school closure affected performance Phase 1 – community sero-survey budgetary implications How has closure of educational institutions affected Extent and impact of planned re-organisation on Import trends, trade policy and impact on internship requirements? health care delivery services manufacturing and wholesale and retail Utilisation patterns during COVID-19: access to trade routine care How has/will the pending shortage of raw Impact of COVID-19 on elective surgery, cancer materials and consumer goods impact life therapy, psychiatric care and dialysis (End Stage in Jamaica? Renal Disease) Assessment of spending on COVID-19: the adequacy and trade-offs Import trends, trade policy, and impact of manufacturing and wholesale and retail trade Assessment of planned lay-offs and pay cuts Impact of COVID-19 on the labour force Assessment of the impact on the Tourism Industry Assessment of the impact on Agriculture and **Fisheries** Engagement Strategies- travellers Case Study- quarantined communities Coping with COVID -vulnerable communities

Figure 1: Coordinated Research Roadmap for COVID-19: Timeline and Budget for Research Activities

13.0 References

- 1. Guan WJ, Ni ZY, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 2020 doi: 10.1056/NEJMoa2002032 [published Online First: 2020/02/29]
- 2. He F, Deng Y, Li W. Coronavirus disease 2019: What we know? *J Med Virol* 2020 doi: 10.1002/jmv.25766 [published Online First: 2020/03/15]
- 3. WHO. Rolling updates on coronavirus disease (COVID-19). Updated 18 April 2020: World Health Organization; 2020 [Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen accessed 21/04/2020 2020.
- 4. WHO. Coronavirus disease 2019 (COVID-2019). Situation Report 115. Geneva, Switzerland: World Health Organization, 2020.
- 5. Vetter P, Eckerle I, Kaiser L. Covid-19: a puzzle with many missing pieces. *BMJ* 2020;368:m627. doi: 10.1136/bmj.m627 [published Online First: 2020/02/23]
- 6. Bedford J, Enria D, Giesecke J, et al. COVID-19: towards controlling of a pandemic. *Lancet* 2020;395(10229):1015-18. doi: 10.1016/S0140-6736(20)30673-5 [published Online First: 2020/03/21]
- 7. Lipsitch M, Swerdlow DL, Finelli L. Defining the Epidemiology of Covid-19 Studies Needed. *N Engl J Med* 2020;382(13):1194-96. doi: 10.1056/NEJMp2002125 [published Online First: 2020/02/20]
- 8. Sanders JM, Monogue ML, Jodlowski TZ, et al. Pharmacologic Treatments for Coronavirus Disease 2019 (COVID-19): A Review. *JAMA* 2020 doi: 10.1001/jama.2020.6019 [published Online First: 2020/04/14]
- 9. Conticini E, Frediani B, Caro D. Can atmospheric pollution be considered a co-factor in extremely high level of SARS-CoV-2 lethality in Northern Italy? *Environ Pollut* 2020:114465. doi: 10.1016/j.envpol.2020.114465 [published Online First: 2020/04/10]
- 10. Ng LF, Lee CY, Lin R, et al. Serological approaches for COVID-19: epidemiologic perspective on surveillance and control. Provisionally accepted. *Front Immunol* 2020 doi: 10.3389/fimmu.2020.00879
- 11. Bloomberg School of Public Health Centre for Health Security (JHU). Serology based tests for COVID-19. [Available from: https://www.centerforhealthsecurity.org/resources/COVID-19/serology/Serology-based-tests-for-COVID-19.html2020.
- 12. CDC. Fact Sheet on Isolation and Quarantine: Centers for Disease Control and Prevention; 2020 [Available from: https://www.cdc.gov/sars/quarantine/fs-isolation.html accessed 05/07/2020 2020.
- 13. Barbisch D, Koenig KL, Shih FY. Is There a Case for Quarantine? Perspectives from SARS to Ebola. *Disaster Med Public Health Prep* 2015;9(5):547-53. doi: 10.1017/dmp.2015.38 [published Online First: 2015/03/24]
- 14. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020;395(10227):912-20. doi: 10.1016/S0140-6736(20)30460-8 [published Online First: 2020/03/01]
- 15. Quinn P. Crisis Communication in Public Health Emergencies: The Limits of 'Legal Control' and the Risks for Harmful Outcomes in a Digital Age. *Life Sci Soc Policy* 2018;14(1):4. doi: 10.1186/s40504-018-0067-0 [published Online First: 2018/02/07]
- 16. WHO. A Coordinated Global Research Roadmap: 2019 Novel Coronavirus. Geneva: World Health Organization, 2020.
- 17. JIS. Jamaica Has 63 Confirmed Cases Of COVID-19: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/jamaica-has-63-confirmed-cases-of-covid-19/ accessed 21/05/2020 2020.
- 18. Latest News. Some Jamaicans now have up to March 24 to enter: Jamaica Observer; 2020 [Available from:
 - http://www.jamaicaobserver.com/latestnews/Some_Jamaicans_now_have_up_to_March_24_to_ente_r?profile=1228_accessed 21/05/2020 2020.

- 19. Jamaica confirms first imported Coronavirus case: Ministry of Health and Wellness; 2020 [updated 21/05/2020. Available from: https://www.moh.gov.jm/jamaica-confirms-first-imported-coronavirus-case/ accessed 21/05/2020 2020.
- 20. JIS. Hefty Fines, Imprisonment For Failure To Self-Quarantine Or Self-Identify: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/hefty-fines-imprisonment-for-failure-to-self-quarantine-or-self-identify/ accessed 21/05/2020 2020.
- 21. JIS. Persons On British Airways Flight Asked To Self-Identify: Jamaica Information Services; 2020 [Available from: https://jis.gov.jm/persons-on-british-airways-flight-asked-to-self-identify/ accessed 22/05/2020 2020.
- 22. Latest News. Passengers on AA 1349 and C'bean Airlines flight 414 urged to make contact: Jamaica Oberver; 2020 [Available from: http://www.jamaicaobserver.com/latestnews/Passengers on AA 1349 and C%26%238217;bean Airlines flight accessed 22/05/2020 2020.
- 23. PM issues warning to passengers who do not observe self-quarantine rules. Friday, March 27, 2020: Jamaica Observer; 2020 [Available from: http://www.jamaicaobserver.com/latestnews/PM issues warning to passengers who do not obser ver self-quarantine rule ?profile=1228 accessed 29/05/2020 2020.
- 24. JIS. 4,500 Travellers Have Reported To The Health Ministry: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/4500-travellers-have-reported-to-the-health-ministry/ accessed 22/05/2020 2020.
- 25. New curfew hours in Jamaica, bars and churches to reopen: Caribbean Business Report; 2020 [Available from: https://caribbeanbusinessreport.com/news/jamaica-to-reopen-bars-and-churches/accessed 03/06/2020 2020.
- 26. JIS. Work From Home Order Expires May 31: Jamaica Information Service; 2020 [accessed 03/06/2020 2020.
- 27. News from the OPM. PM Announces Phased Reopening of Jamaica's Borders with Strict Protocols: Office of the Prime Minister; 2020 [Available from: https://opm.gov.jm/news/pm-announces-phased-reopening-of-jamaicas-borders-with-strict-protocols/ accessed 03/06/2020 2020.
- 28. WHO. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19) World Health Organization, 2020.
- 29. WHO. Strengthening the health system response to COVID-19. Recommendations for the WHO European Region. Policy Brief (1 April 2020): World Health Organization, 2020.
- 30. NIH Clinical Center. Patient Recruitment. Ethics in Clinical Research. Ethical Guidelines: Department of Health and Human Services. National Institutes of Health; 2020 [Available from: https://clinicalcenter.nih.gov/recruit/ethics.html accessed 04/28/2020 2020.
- 31. United States. Department of Health and Human Services, United States. Food and Drug Administration, Center for Biologics Evaluation and Research (U.S.), et al. E6(R2) good clinical practice: integrated addendum to ICH E6(R1). Guidance for industry. Silver Spring, MD: Center for Drug Evaluation and Research, 2018:1 online resource (1 PDF file (iv, 63 pages)).
- 32. Planning Institute of J. Vision 2030 Jamaica: national development plan. Kingston, Jamaica: Planning Institute of Jamaica 2009.
- 33. Straus SE, Tetroe JM, Graham ID. Knowledge translation is the use of knowledge in health care decision making. *J Clin Epidemiol* 2011;64(1):6-10. doi: 10.1016/j.jclinepi.2009.08.016 [published Online First: 2009/11/21]
- 34. Grimshaw JM, Eccles MP, Lavis JN, et al. Knowledge translation of research findings. *Implement Sci* 2012;7:50. doi: 10.1186/1748-5908-7-50 [published Online First: 2012/06/02]
- 35. Ferguson N, LLaydon D, Nedjati-Gilani G, et al. Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. London: Imperial College COVID-19 Response Team. Imperial Colleage, 2020.
- 36. Madhav N, Oppenheim B, Gallivan M, et al. Pandemics: Risks, Impacts, and Mitigation. 2017:315-45.

- 37. Stoto MA. The effectiveness of U.S. public health surveillance systems for situational awareness during the 2009 H1N1 pandemic: a retrospective analysis. *PLoS One* 2012;7(8):e40984. doi: 10.1371/journal.pone.0040984 [published Online First: 2012/08/29]
- 38. JIS. Schools Remain Closed Until May 31, 2020: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/schools-remain-closed-until-may-31/ accessed 03/06/2020 2020.
- 39. Schools Closed for 14 Days in Light COVID-19: Office of the Prime Minister; 2020 [Available from: https://opm.gov.jm/news/schools-closed-for-14-days-in-light-covid-19/ accessed 03/06/2020 2020.
- 40. JIS. Seniors 70 Years and Older Must Stay Home: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/seniors-70-years-and-older-must-stay-home/ accessed 03/06/2020 2020.
- 41. Nightly COVID-19 Curfew Now in Effect: The Gleaner; 2020 [Available from: http://jamaica-gleaner.com/article/news/20200401/nightly-covid-19-curfew-now-effect.
- 42. JIS. Prime Minister Calls On Jamaicans To Maintain Social Distancing: Jamaica Information Service; 2020 [Available from: https://jis.gov.jm/prime-minister-calls-on-jamaicans-to-maintain-social-distancing/ accessed 03/06/2020 2020.
- 43. Ministry issues recommendations for the wearing of masks: Ministry of Health and Wellness; 2020 [Available from: https://www.moh.gov.jm/ministry-issues-recommendations-for-the-wearing-of-masks/ accessed 03062020 2020.

Appendices

Appendix 1: COVID-19 Research Working Group Membership

Research Working Group	Working Group Position	Members	Institutional Affiliation	Job Title
National Research Agenda	Chair	Dr. Karen Webster Kerr	MOHW	Principal Medical Officer, National Epidemiologist
COVID-19 Steering	Co-Chair	Ms Leesha Delatie-Budair	STATIN	Deputy Director General
Committee	Secretariat:	Epidemiological Research &		
		Data Analysis Unit		
		Dr. Andriene Grant	MOHW	Director, ERDAU
		Miss Romae Thorpe	MOHW	Biostatistician
		Mrs Tanielle Mullings	MOHW	Research Officer
		Documentation:		
		Chair: Dr Maurice McNaughton	MOHW	Director, Centre of Excellence and Innovation
		Co-chair: Beverley Lashley	National Library of Jamaica	National Librarian
		Member: Vinnese Cameron-Dias	MOHW	Director, Documentation Information and Access Services
		Dr Nadia Bennett	CAIHR, UWI	Research Fellow
		Myrna Doublas	UWI	Law Librarian
		Dr. Lila Rao-Graham	Deputy Executive Director	Mona School of Business, UWI
		Dr. Suzanna Russell	Senior Lecturer	Mona School of Business, UWI
Clinical & Laboratory	Chair	Prof. Marvin Reid	CAIHR, UWI	Director, Tropical Metabolism Research Unit
	Co-Chair Clinical	Dr. Naydene Williams	MOHW	Director, Health Services Planning and Integration (Actg.)
	Co-Chair Laboratory	Dr. Michelle Hamilton	MOHW	Director, National Laboratory Services
	Members:	Dr Trevor Ferguson	CAIHR, UWI	Senior Lecturer, Epidemiology
		Prof. Marshall Tulloch-Reid	CAIHR, UWI	Director, Epidemiology Research Unit
		Dr. Jacqueline Vigilance	NCU	Director, Research
		Prof. Paul Gyles	NCU	Provost
		Mrs. Tanielle Mullings	MOHW	Research Officer
		Prof. Peter Figueroa	UWI	Consultant/Professor, Public Health, Epidemiology and HIV-AIDS, Department of Community Health and Psychiatry
		Prof. Michael Boyne	UWI	Department of Medicine
		Prof. Celia Christie	UWI	Department of Child Health

Research Working Group	Working Group Position	Members	Institutional Affiliation	Job Title
		Dr. Tracey Evans-Gilbert	UWI	Department of Paediatrics
Epidemiological/Surveillance	Chair	Dr. Jacqueline Duncan	UWI	Senior Lecturer/Consultant
a. Case & Contact	Co-Chair	Dr. Iyanna Wellington	MOHW	Medical Officer, Communicable Diseases
	Members:	Dr. Cathi Williams	MOHW	Medical Officer, Communicable Disease Surveillance
		Dr. Beryl Irons		Retired PAHO/WHO Advisor
		Dr. Trevor Ferguson	CAIHR, UWI	Senior Lecturer, Epidemiology
		Prof. Marshall Tulloch-Reid	CAIHR, UWI	Director, Epidemiology Research Unit
		Dr. Ardene Harris	MOHW	Medical Epidemiologist, National Surveillance Unit
		Dr. Nadia Bennett	CAIHR, UWI	Research Fellow
		Prof. Peter Figueroa	UWI	Consultant/Professor, Public Health, Epidemiology and HIV-AIDS, Department of Community Health and Psychiatry
b. Household & Community	Chair	Prof. Affette McCaw-Binns	UWI	Professor, Reproductive Health and Epidemiology, Department of Community Health and Psychiatry
	Co-Chair	Dr. Ardene Harris	MOHW	Medical Epidemiologist, National Surveillance Unit
	Co-Chair	Dr. Kelly-Ann Gordon-Johnson	MOHW	Grant Manager, Surveillance and Response to Avian and Pandemic Influenza in Jamaica
	Members:	Ms. Leesha Delatie-Budair	STATIN	Deputy Director General
		Dr. Natalee Simpson	STATIN	Director, Surveys Division
		Ms. Philone Mantock	STATIN	Head, Special Projects
		Ms. Amanda Lee	STATIN	Statistician, RDE
		Mrs. Denese McFarlane	PIOJ	Health Specialist
		Dr Beryl Irons		Retired PAHO/WHO Advisor
		Dr Andriene Grant	MOHW	Director, ERDAU
		Ms. Joy Braham	NCU	Lecturer, School of Nursing
		Dr. Trevor Ferguson	CAIHR, UWI	Senior Lecturer, Epidemiology
		Mrs. Pauline Anderson-Johnson	UWISON, UWI	Lecturer
		Dr. Althea Bailey	UWI	Lecturer, Department of Community Health and Psychiatry
		Dr. Christine Walters	UWI	Lecturer
		Dr. Fitzroy Henry	UTech	Professor of Public Health and Nutrition
Health System	Chair	Dr. Georgiana Gordon-Strachan	CAIHR, UWI	Senior Lecturer, Epidemiology and Health Policy
 	Co-Chair	Mr Jasper Barnett	MOHW	Director (Acting), Health Systems Improvement
	Members:	Dr. Andriene Grant	MOHW	Director, ERDAU
		Dr. Jacqueline Vigilance	NCU	Director, Research
		Mrs Denese McFarlane	PIOJ	Health Specialist
		Dr. Tazhmoye Crawford	NFPB	Director, Monitoring, Evaluation and Research

Research Working Group	Working Group Position	Members	Institutional Affiliation	Job Title
		Dr. Michelle Harris	РАНО	Advisor, Non-Communicable Diseases and Mental Health
		Dr. Ishtar Govia	CAIHR, UWI	Lecturer, Epidemiology
		Mr. Casimiro Dias	РАНО	Health Systems Advisor
Socio-Economic	Chair	Ms. Leesha Delatie-Budar	STATIN	Deputy Director General
	Co-Chair	Mr. James Stewart	PIOJ	Senior Director, Economic Planning & Research Division
	Co-Chair	Dr Kelly-Ann Dixon-Hamil	UWI/FSS	Lecturer/Assistant Professor in Statistics
	Members:	Ms. Carol Coy	STATIN	Director General
		Dr. Natalee Simpson	STATIN	Director, Surveys Division
		Ms. Jessica Campbell	STATIN	Director, Research Design and Evaluation
		Ms. Paula Jackson	STATIN	Director, Economic Accounting
		Ms. Hope Perkins	STATIN	Senior Statistician
		Mr. Trevor Anderson	MOFPS	Actg. Principal Director, Fiscal Policy Management Branch
		Dr. Fabian Lewis	MOFPS	Director, Research and Analysis Unit,
		Mr. Aayon Cruickshank	MOFPS	Director, Trade Policy Unit
		Mr Hank Williams	TAJ	Deputy Commissioner General for Strategic Services
		Mr. Vincent Irving	TAJ	Director, Forensic Data mining
		Mr. David Smalling	TAJ	Economic Analyst
		Ms. Shantol Roye	TAJ	Statistician
		Mr. Hugh Morris	PIOJ	Director, Modelling & Research
		Mr. Robert Stennett	BOJ	Division Chief, Research & Economic Programming
		Mrs. Prudence Serju-Thomas	BOJ	Senior Director, Research
		Mr. Jasper Barnett	MOHW	Director (Acting), Health Systems Improvement
		Ms. Shelleka Darby	MICAF	Agricultural Trade Officer
		Ms. Daenia Ashpole	MICAF	International Trade Specialist
Communication	Chair	Dr Althea Bailey	Faculty of Medical Sciences UWI	Lecturer, Department of Community Health and Psychiatry
	Co-Chair	Dr Michelle Harris	РАНО	Advisor Non-Communicable Diseases and Mental Health
	Members:	Dr Ishtar Govia	CAIHR, UWI	Lecturer, Epidemiology
		Dr Livingston White	CARIMAC, UWI	Director, Caribbean School of Media and Communication
		Dr Marcia Thelwell-Reid	UTech	Associate Professor, Joint Colleges of Medicine, Oral Health and Veterinary Sciences
		Dr Christine Walters	Faculty of Medical Sciences UWI	Lecturer & Health Research Scientist
		Dr Janet Campbell-Shelly	UTech	Associate Professor and Dean, College of Health Sciences
		Mr. Artan Jama	РАНО	Communications Consultant
Policy	Chair	Mr. Shawn Grey	OPM	Director, Performance Management and Evaluation

Research Working Group	Working Group	Members	Institutional Affiliation	Job Title
	Position		Annation	
	Co-chair	Mr. Howard Lynch	MOHW	Director, Policy, Planning and Development
	Members:	Mr. Easton Williams	PIOJ	Senior Director, Social Policy, Planning and Research
		Mrs. Denese McFarlane	PIOJ	Health Specialist
		Mr. Gary Campbell	MSET	Director, Technology
		Dr. Georgiana Gordon-Strachan	CAIHR, UWI	Senior Lecturer, Epidemiology and Health Policy
		Dr. Ishtar Govia	CAIHR, UWI	Lecturer, Epidemiology

<u>Key:</u> CAIHR – Caribbean Institute of Health Research; CARIMAC – Caribbean School of Media and Communication; MICAF – Ministry of Industry, Commerce, Agriculture and Fisheries; MOFPS – Ministry of Finance and the Public Service; MOHW – Ministry of Health and Wellness; MSET – Ministry of Science, Energy and Technology; NCU – Northern Caribbean University; NFPB – National Family Planning Board; OPM – Office of the Prime Minister; PAHO – Pan American Health Organization; PIOJ – Planning Institute of Jamaica; SALISES – Sir Arthur Lewis Institute for Social and Economic Studies; STATIN – Statistical Institute of Jamaica; TAJ – Tax Administration Jamaica; UTech – University of Technology; UWI – University of the West Indies; UWI(SON – UWI School of Nursing