Introduction

In the context of the COVID-19 pandemic, some countries have been performing syndromic screening of travellers who cross land borders. Methods include screening for fever and respiratory or other symptoms, observation and completion of health declaration forms. This strategy has been used by some countries before the emergence of COVID-19 for other communicable diseases including Ebola virus disease, respiratory infections such as pandemic H1N1 and plague.

There are questions about whether syndromic screening can be effective for controlling the spread of COVID-19 among travellers crossing borders via land because unlike air travellers they make crossings as frequently as daily. They include commuting workers, market salespeople, students, people seeking health care and those visiting family members, among others, Communities neighbouring land borders are often very closely connected by economic and social activities and family ties. They also include migrants and refugees, whose reasons for crossing borders are often different than that of most air and marine travellers, though no study included in this scientific brief referred to them. The issue of informal ground crossings and porous borders adds complexity to the assessment of the effectiveness of any intervention used to control the spread of COVID-19 and other infectious diseases including in the context of humanitarian crisis.

Purpose of this document

This document, which is targeted at public health and border crossing policy makers, evaluates available scientific evidence regarding the efficacy of syndromic screening to prevent or limit the spread of COVID-19 at land borders and international river crossings.

Key question

The PICO question (Population, Intervention, Comparison, Outcome) for this enquiry was to determine the impact of COVID-19 syndromic exit and entry screening of travellers who cross land borders.

Population = all travellers via land borders.
Intervention = syndromic entry and exit screening of travellers via land borders.
Comparison = no syndromic entry and exit screening of travellers via land borders.
Outcome = efficacy in reducing transmission or improving outbreak dynamics; safety, tolerability and harms; acceptability; quantitative or qualitative outputs such as cost; feasibility; consequences on health systems; sociocultural, political and legal impacts; frequency of checks (routine versus only when epidemiological situation requires them), formalization of cross-border collaboration.

Process and methodology

An independent systematic review was performed to address the aforementioned PICO question. The quality of the evidence was rated using the GRADE approach (Grading of Recommendation, Assessment, Development and Evaluation) as high, moderate, low or very low (1). The external systematic review team used the Newcastle-Ottawa Scale (NOS) to assess the quality of the included studies. The WHO International Travel and Health Guidelines Development Group (ITH GDG), an independent external expert group, reviewed the evidence and drew conclusions.
Research evidence

The review found seven observational studies from Bulgaria, China, Germany, Hong Kong Special Administrative Region, China, Nepal, South Sudan and Uganda published from 2020 to January 2022 that examined the usefulness of COVID-19 screening at border crossings (2-8). Only one of these studies, from Uganda, sought to determine the effectiveness of syndromic screening (using thermal screening) at a land border(8). This was a retrospective cross-sectional study based on a review of body temperature and polymerase chain reaction (PCR) SARS-CoV-2 test results records for 7181 truck drivers entering Uganda through Mutukula, United Republic of Tanzania between 15 May and 30 July 2020. The sensitivity, specificity, positive predictive value, negative predictive value, positive and negative Likelihood ratios were obtained using the PCR assay as the gold standard. The proportion of persons testing positive for COVID-19 was 6.7% (95% CI: 6.1–7.3). The sensitivity and specificity of thermal screening were 9.9% (95% CI: 7.4–13.0) and 99.5% (95% CI: 99.3–99.6) respectively. The positive and negative predictive values were 57.8 (95% CI: 46.5–68.6) and 93.9 (95% CI: 93.3–94.4) respectively. The positive and negative Likelihood Ratios (LRs) were 19 (95% CI: 12.4–29.1) and 0.9 (95% CI: 0.88–0.93) respectively. The authors concluded that in this study population, thermal screening alone was ineffective for detecting COVID-19 cases at points of entry.

None of the other six studies found through the systematic review sought specifically to determine the effectiveness of syndromic screening at land borders or international river crossings(2-7). The other studies used syndromic screening in association with other follow-up measures, including SARS-CoV-2 testing or quarantine, and two included air travel. Across studies, the proportion of cases detected by screening ranged from 2.2% to 43.6%, with marked variation according to the screening method used.

Available evidence does not provide support for or against syndromic screening being associated with harms.

Conclusions

WHO finds that there is a lack of evidence to support syndromic screening for COVID-19 with the aim of preventing transmission of SARS-CoV-2 at entry or exit among travellers at land borders.

It is important to note that unstructured and informal crossing points where administrative controls such as health, customs, immigration authorities are not present, (unlike at ports or airports) – allow travellers to avoid check points by crossing borders via informal routes and this adds complexity to the assessment of effectiveness of the intervention. Considering the unpredictability of the transmission behaviour of SARS-CoV-2 variants, the overall effectiveness of syndromic screening efforts may vary from country to country. Screening may deliver a false sense of security to travellers and neighbouring communities. Communication between countries/states/territories is important for the appropriate interpretation and use of screening results though this is sometimes challenging because countries usually have their own rules for cross border information sharing. Therefore, this requires considerable efforts to coordinate in between countries concerned.

It is unclear whether syndromic screening has an impact on health equity, equality and non-discrimination. People experiencing disability may be disproportionately impacted by syndromic screening at land crossings, which may cut them off from healthcare services they require across the border or from caregivers who may reside across borders.

It is unclear whether the balance between desirable and undesirable societal implications favour syndromic screening. There is a need for research on the effectiveness/success of syndromic screening versus testing, quarantine and other public health and social measures or syndromic screening coupled with other health measures.

To obtain more evidence on the financial and societal impact of syndromic screening, further studies would be required. This is also the case for feasibility within health systems, which may differ by the phase of epidemic and the capacities of health systems.
Limitations

The evidence was limited to seven observational studies that evaluated border measures or outbreak investigations, and only one of those studies addressed the research question of this enquiry.

Most studies took place early in the pandemic before the deployment of vaccines, and all studies took place before the emergence of circulating variants that display different transmission dynamics and symptoms. Assessing the real-world impact of syndromic screening is challenging in the context of SARS-CoV-2, but there is very little evidence to suggest that syndromic surveillance reduce the risk of the disease crossing borders, and there were no studies that were able to detect an epidemiological shift due to entry of international travellers into the country while employing a syndrome or symptom-based screening at land borders.

Substantial knowledge gaps exist from a data stratification and reporting standpoint (including effectiveness outcomes stratified according to socioeconomic status, ethnicity, religion or citizenship) and from the standpoint of traveller experience. Such gaps underscore the need for future active surveillance in this area and research designs that meaningfully disentangle differential impacts of syndromic screening strategies.

References


Contributors

Steering group members are WHO Headquarters and Regional staff and relevant UN staff and cover the technical areas of laboratory, surveillance, International Health Regulations secretariat, disability, international travel health and border health. The steering group and external review group (ERG) members provided feedback on draft PICO questions and draft guidance documents. Systematic review teams conducted systematic reviews. Methodologists worked as liaisons between the GDG and systematic review teams and also assisted GDG with their expertise in the evidence-to-decision process. The GDG discussed methodologies, made final decisions on PICO questions, reviewed synthesized evidence and GRADE summary of findings tables provided by the systematic review team, developed the evidence to decision framework and made the conclusions presented in this brief based on consensus through thorough discussions and unblinded voting.
**Guideline Development Group (GDG) members**

**Dr Seif Salem Al-Abri**  
Ministry of Health  
Oman

**Dr Bhawana Amatya**  
CIWEC Hospital and Travel Medicine Centre  
Nepal

**Professor Lucille Blumberg**  
National Institute for Communicable Disease (NICD), South Africa

**Dr. Andrea Boggild (Chair)**  
Department of Medicine  
Division of Infectious Diseases  
Toronto General Hospital and University of Toronto, Canada

**Dr Sarah Borwein**  
Beacon Medical Centre  
China, Hong Kong SAR

**Dr Clive Brown**  
Division of Global Migration and Quarantine  
Centers for Disease Control and Prevention  
United States of America

**Dr Corey Forde**  
Queen Elizabeth Hospital  
Barbados

**Dr Christiana Monica Fortune**  
Ministry of Health & Sanitation  
Sierra Leone

**Dr Andrea Grout**  
James Cook University  
College of Business, Law and Governance, Australia

**Dr Wasin Matsee**  
Travel Medicine Research Unit  
Department of Clinical Tropical Medicine  
Faculty of Tropical Medicine, Mahidol University, Thailand

**Dr Mohamed Moussif**  
Sanitary Border Health Control Division  
Casablanca International Airport  
Ministry of Health, Morocco

**Dr Dipti Patel**  
National Travel Health Network and Centre and Occupational Medicine  
United Kingdom of Great Britain and Northern Ireland

**Dr Priscilla Rupali**  
Christian Medical College  
Vellore Tamilnadu, India

**Professor Patricia Schlagenhauf**  
University of Zurich,  
Switzerland
Guideline methodologists

Mr Ameer Steven-Jörg Hohlfeld
South African Medical Research Council
South Africa

Dr Eleanor Atieno Ochodo
Kenya Medical Research Institute
Kenya

Systematic review teams

Dr Ahmed Abou-Setta
Unity Health Toronto
Canada

Assoc Professor Mark E Engel
University of Cape Town
South Africa

External Review Group (ERG) members

Dr Lin H Chen
Harvard Medical School
United States of America

Dr Syed Asif Altaf Chowdhury
International Transport Workers’ Federation
United Kingdom

Assoc. Prof. Ngo Thi Hoa, PhD
Centre for Tropical Medicine
Oxford University, United Kingdom

Mr Jens Hügel
International Road Transport* Union
Switzerland

Dr Rochelle Lee
South African Society of Travel Medicine
South Africa

Professor Pedro Legua
Universidad Peruana Cayetano Heredia
Peru

Dr Rebecca D Merrill
Division of Global Migration and Quarantine
Centers for Disease Control and Prevention
United States of America

Professor Robert Steffen
International Society of Travel Medicine Foundation
Switzerland

Ms Lindsay Lee
Data Analyst, wheelchair user, frequent traveller
United States of America
Syndromic screening for COVID-19 of travellers crossing land borders: scientific brief

Steering group

United Nations Organizations

Dr Alejandra Elisabeth Cruz Ross
International Labour Office

Dr Andrew Mbala
International Organization for Migration/The UN Migration Agency

Dr Kolitha Wickramage
International Organization for Migration/The UN Migration Agency

Dr Pierre-Yves Oger
UNICEF

WHO Headquarters

Dr Maria van Kerkhove, Dr Siddhivinayak Shriram Hirve, Dr Dennis Falzon, Dr Patrick Zuber, Dr Frank Konings, Dr Olivier Le Polain, Dr Carmen Dolea, Dr Alarcos Cieza, Dr Kaloyan Kamenov, Dr Ninglan Wang, Dr Mika Kawano, Dr Aurelien Pekezou

WHO Regional Offices

Dr Tamara Moncero (Regional Office for the Americas)
Dr Jessica Berry (Regional Office for the Eastern Mediterranean)
Dr Maung Htike (Regional Office for South-East Asia)
Dr Ihor Perehintes (Regional Office for Europe)
Dr Mary Stephen (Regional Office for Africa)
Dr Phuong Nam Nguyen (Regional Office for the Western Pacific)

Declarations of interest

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