Brazilian health system preparedness for COVID-19

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Infrastructure

- COE-COVID-19/SVS/MS (Public Health Emergency Operations Center/Health Surveilance Secretariat/Ministry of Health).
- National reference laboratories for respiratory diseases (IAL, IEC, FIOCRUZ)
- States' central laboratories (LACEN)
- State and municipality health secretariats

Infrastructure

- COE-COVID-19/SVS/MS (Public Health Emergency Operations Center, Health Surveilance Secretariat, Ministry of Health).

Example of activities:
    Coordinate and publish contingency plan and action protocols according to WHO recommendations and experts' consultation.
    Compile and publish official data (national and international case counts).
    Coordinate public communication at the national level.

Infrastructure

- National reference laboratories for respiratory diseases: Instituto Adolfo Lutz (IAL), Instituo Evandro Chagas (IEC), and Fiocruz.

Perform high quality, internationaly validaded lab tests (PCR, genome sequencing, ...). Recognized by WHO as National Influenza Centers.
Responsible for cross-checking inconclusive lab results from LACENs, performing specific covid-19 tests for suspect cases that had negative result for other respiratory infection viruses from LACENs, ...

It is part of the Brazilian universal public health system (SUS).

Infrastructure

- States' central laboratories (LACEN)

Responsible for performing lab test for epidemiological surveillance, such as those related to respiratory illnesses (ILI and SARI cases).
Follows protocols established by the Ministry of Health (MH) and can opt, by aggrement with the corresponding state government, to perform additional exams. For example, the LACEN at Paraná state tests the 4 seazonal coronaviruses as part of their panel for SRAG surveillance, even though it is not mandated by the MH.

It is part of the Brazilian universal public health system (SUS).

Infrastructure

• State and municipality health secretariats

Coordinate state/municipal level actions and protocols for disease surveillance.
Consolidate and submit to the federal agency the state's case notifications.
Promote training and protocol updates for health care professionals from the corresponding public health units.

It is part of the Brazilian universal public health system.

COVID-19 protocols

- Suspect case definition:
  - Fever AND at least one respiratory symptom (cough, dificulty breathing, ...) AND travel history to area of local transmition, as defined by WHO, in the last 14 days prior to symptoms onset; OR
  - Fever AND at least one respiratory symptom (cough, dificulty breathing, ...) AND history of close contact with covid-19 suspect case in the last 14 days prior to symptoms onset;
  - Fever OR at least one respiratory symptom (cough, dificulty breathing, ...) AND history of close contact with covid-19 laboratory confirmed case in the last 14 days prior to symptoms onset.

COVID-19 protocols

- Confirmed case:
  - Person with laboratory confirmed infection by covid-19, regardless of symptoms.

- Discarded case:
  - Case that meets suspect case criteria but has laboratory confirmation of infection by other infectious agent OR negative result for covid-19.

COVID-19 suspect case lab flux

- LACEN runs regular SARI pannel.
  - If positive for any infectious agent different from covid-19, the case is discarded;
  - If negative or inconclusive for any infectious agent different from covid-19, the sample is sent to the national reference laboratory for specific regular SARI pannel from NIC AND covid-19.

This protocol is based on the premise that the percentage of coinfection by multiple respiratory agents is significantly low. If that premise is not met for this particular virus, this protocol can lead to subnotification.

The literature reports respiratory virus coinfection at the order of 2%-27%, with RSV and Influenzas being the most common pair.

Rotzén-Östlund, M., Eriksson, M., Tiveljung Lindell, A., Allander, T., Zweygberg Wirgart, B. and Grillner, L. (2014), Children with multiple viral respiratory infections are older than those with single viruses. Acta Paediatr, 103: 100-104. doi:10.1111/apa.12440
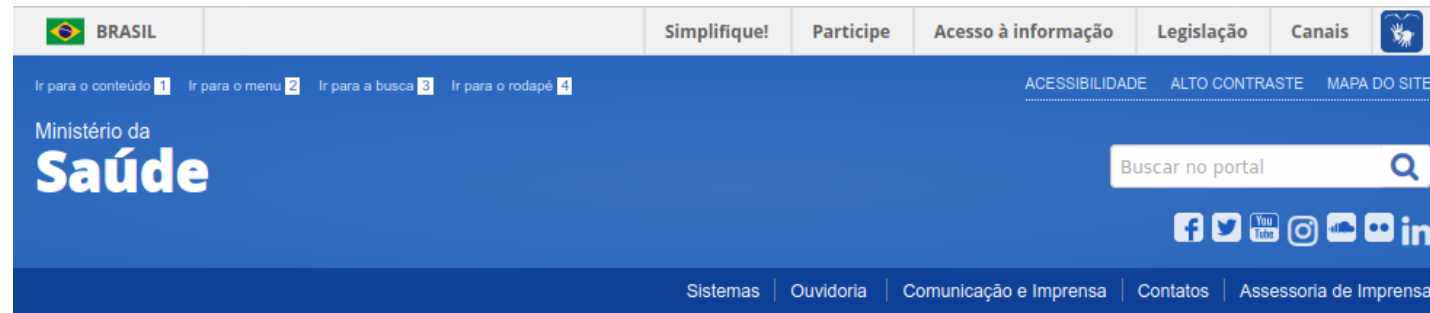
COVID-19 suspect case lab flux

- As of March 2, the Ministry of Health announced that it will provide 30 thousand covid-19 kits for the LACENs so that they can run the test locally without need to send to national reference lab:

"Inicialmente, serão distribuídos 10 mil kits de diagnóstico aos LACENs dos estados do Amazonas, Pará, Roraima, Bahia, Ceará, Pernambuco, Sergipe, Rio de Janeiro, Espírito Santo, Minas Gerais, Distrito Federal, Mato Grosso do Sul, Rio Grande do Sul, Paraná e Santa Catarina, contemplando todas as regiões do país. A Fundação Oswaldo Cruz (Fiocruz), no Rio de Janeiro, por meio do laboratório de Biomanguinhos, iniciará a produção e distribuição dos testes ainda nesta quarta-feira (4)"

https://www.saude.gov.br/noticias/agencia-saude/46472-brasil-amplia-diagnostico-para-o-coronavirus

Official information in Brazil

- Information center:
  https://www.saude.gov.br/saude-de-a-z/coronavirus

Official information in Brazil

- Situation report:
http://plataforma.saude.gov.br/novocoronavirus

Official information in Brazil

State	Suspect	Confirmed	Discarded
TOTAL	433	2	162
SP - São Paulo	163	2	48
RS - Rio Grande do Sul	73	0	10
MG - Minas Gerais	48	0	4
RJ - Rio de Janeiro	42	0	27
SC - Santa Catarina	36	0	4
DF - Distrito Federal	12	0	3
BA - Bahia	9	0	14
PR - Paraná	7	0	8
CE - Ceará	6	0	6
MS - Mato Grosso do Sul	6	0	1
ES - Espírito Santo	5	0	6
MT - Mato Grosso	5	0	0

State	Suspect	Confirmed	Discarded
PE - Pernambuco	4	0	10
AL - Alagoas	3	0	1
GO - Goiás	3	0	7
PA - Pará	2	0	2
RN - Rio Grande do Norte	2	0	6
PB - Paraíba	2	0	1
RO - Rondônia	1	0	0
AM - Amazonas	1	0	1
MA - Maranhão	1	0	1
PI - Piauí	1	0	2
SE - Sergipe	1	0	0

Ministry of Health, accessed 2020-03-02

COVID-19 risk in Brazil

Fake news can a serious public health issue!
The deterioration of traditional media confidence by the public, followed by adoption of alternative, unsupported by evidence, sources of (mis)information can lead to health risks such as:

- Adoption of innefective treatment instead of validated/health professional appointed treatment;
- Disregard for vaccination calendar;
- Unnecessary rush to hospitals driven by fear, causing disruption or collapse of the unit's ability to properly tend to those in need.

COVID-19 risk in Brazil

Fake news can a serious public health issue!

Trying to minimize its effect, the SVS launched a dedicated website for debunking covid-19 related fake news:

https://www.saude.gov.br/fakenews/coronavirus

What about importation risk?

COVID-19 risk in Brazil

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China-Brazil	113.117 (~310/day)	1.439.323.776

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USA-Brazil	2.535.940 (~6948/day) ~22x	331.002.651 ~1/4

COVID-19 risk in Brazil

What about dispersion inside the country?
- Need up-to-date international flow to properly assess invasion risk at different points-of-entry. Unfortunately, current ANAC regulation does not require aggregated trip counts data sharing, only direct flights.

COVID-19 risk in Brazil

What about dispersion inside the country assuming São Paulo becomes a source of local transmission?

COVID-19 risk in Brazil

What about dispersion inside the country assuming São Paulo becomes a source of local transmission?

WARNING!!! THE FOLLOWING PRELIMINARY ESTIMATES CONSIDERS ONLY DISPERSAL FROM SÃO PAULO, BASED ON AIRLINE DATA FROM 2014. IT DOES NOT INCLUDE CASE IMPORTATION FROM OTHER COUNTRIES.

COVID-19 risk in Brazil

Destination	State	Effective distance	Relative eff. dist.
RIO DE JANEIRO	RJ	2.777	1.000
PORTO ALEGRE	RS	3.537	1.274
BRASÍLIA	DF	3.583	1.291
CURITIBA	PR	3.764	1.356
BELO HORIZONTE	MG	3.779	1.361
SALVADOR	BA	3.853	1.388
RECIFE	PE	4.069	1.465
FORTALEZA	CE	4.236	1.526
FLORIANÓPOLIS	SC	4.280	1.542
GOIÂNIA	GO	4.367	1.573
VITÓRIA	ES	4.625	1.666
CUIABÁ	MT	4.912	1.769

Destination	State	Effective distance	Relative eff. dist.
NAVEGANTES	SC	4.960	1.787
MACEIÓ	AL	5.042	1.816
CAMPO GRANDE	MS	5.048	1.818
FOZ DO IGUAÇU	PR	5.152	1.855
PORTO SEGURO	BA	5.275	1.900
RIBEIRÃO PRETO	SP	5.345	1.925
UBERLÂNDIA	MG	5.403	1.946
MANAUS	AM	5.422	1.953
NATAL	RN	5.438	1.958
LONDRINA	PR	5.462	1.967
SÃO JOSÉ DO RIO PRETO	SP	5.465	1.968
BELÉM	PA	5.573	2.007

Thank you!

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