

Title: Variants of Concern Cases and Processes in Ireland, including an update on Global Epidemiology for NPHE

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Recommendations:

- 1. That mandatory quarantine and testing be enforced for all incoming travellers having originated, or transited through, category 2 countries.** Recent contact tracing activities conducted on a flight containing three confirmed cases of the Brazilian P.1 variant highlighted the significant numbers of travellers not adhering to self-isolation and testing guidelines. As well as posing a significant risk of introduction and transmission of variants of concern from international travellers, this places a huge burden on Departments of Public Health and Contact Tracing Centres, which is not sustainable.
- 2. That a robust process is put in place to check and verify negative PCR tests performed up to 72 hours prior to the departure of any incoming international travellers, and that Medical Officers of Health have access to these reports.**
- 3. That Portugal and all South American countries be added to the category 2 list of countries.** The close travel and geographical links between Brazil and these countries is considered to increase the risk of spread of the Brazilian P.1 variant of concern
- 4. That an Impact Assessment be performed on the possible increased demand placed on Departments of Public Health and Contact Tracing Teams following the addition of the above countries to the Category 2 list.**

Of Note:

Low uptake day 5 tests - A large proportion of incoming international travellers are not partaking of their covid-19 test on Day 5. For example, 7 of 91 (7.7%) passengers on a flight carrying 3 confirmed cases of the Brazilian P.1 variant of concern presented for testing on day 5. Considerable Public Health resources are taken up in attempting to trace these individuals and to organise testing.

Incomplete Passenger Locator Forms – this is problematic. This repeatedly causes significant delays in Public Health’s ability to contact trace passengers and sometimes results in an inability to fully contact trace all passengers on incoming flights of concern. This therefore creates a significant risk of the introduction and spread of variants of concern.

Testing at day 10 - two confirmed case of the P.1 Brazilian variant, became symptomatic at days 11 and 13 after arriving in Ireland. Therefore it is strongly recommended that individuals with a history of travel or transit through a category 2 country be tested on day 10, prior to their release from self-isolation, as per close contact testing recommendations.

Update:

- In addition to the 4 Variants of Concern (B117, B1.351, P.1 and B117 with E484K mutation), the UK are now monitoring the presence of 3 Variants Under Investigation:
 - P2 (Brazil)
 - A.23.1 with E484K
 - B1.525
- Several European countries are also monitoring the B1.525 VUI (further information in section 3). In the UK, most cases are associated with travel from Nigeria and Ghana. Imported cases also reported in Canada, Norway and Denmark – mainly associated with travel from Nigeria
- Cases of B 1.351 (South African variant) are increasing in countries worldwide and increasing numbers have no link to international travel
- From the Austrian outbreak in the Tyrol region, there is anecdotal evidence of transmission of B1.351 4 days prior to onset of symptoms
- In Austria, 6 people previously infected with “wild type” covid-19 (in Sept-Dec) have recently been re-infected with B1351
- NCDHP meeting with PHE 19th Feb 2021: Key issues: No evidence of widespread transmission B117 with E484K; Travellers from high risk countries for P1 and B1351 are tested at day 2 and day 8; 15-20 cases a week B1351; Request to vaccine manufacturers to adjust vaccine composition; Currently WGS 20% cases per week - aiming for 50%; Samples sequenced in research consortia are anonymised - PHE hold research key to enable identification of cases for Public Health intervention.

Section 1: International epidemiology of Variant of Concern

1.1 South African Variant (B.1.351)

More than 90% of cases sequenced in South Africa since late November have been due to this variant and there is evidence that the variant has been circulating since at least November in Mozambique as well, indicating that it may be widespread in other countries in the region where sequencing is not performed or publicly reported.

Table 1 presents the international detected cases of the South African variant:

Country	Total cases reported in media or via IHR/EWRS	Confirmed sequences in GISAID	Cases imported or evidence of local community transmission
Australia	18	20	Imported cases
Austria	305	16	Community transmission
Bangladesh	1	1	Unknown
Belgium	99	83	Unknown
Botswana	1	38	Unknown
Brazil	1		Unknown
Canada	41	2	Community transmission
China	1		Imported cases
Cuba	1		Imported cases
Democratic Republic of the Congo		1	
Denmark	8	7	Unknown
Finland	20	7	Unknown
France	41	67	Unknown
Gambia	1	0	Unknown
Germany	20	8	Unknown
Ghana	Not specified		Unknown
Greece	1		Unknown
Guinea Bissau	1		
Ireland	11	10	Unknown
India	4		
Israel	80	7	Unknown

Italy	2		Imported cases
Japan	3	5	Unknown**
Kenya	3	6	Unknown
La Reunion	43		
Luxembourg	27	2	Unknown
Malawi	-		Exported cases*
Malta	1		
Mayotte	78	93	Unknown
Mozambique	Not specified	42	Unknown
Netherlands	32	31	Unknown
New Zealand	10	7	Local transmission
Norway	30	1	Imported cases
Panama	1	1	Imported cases
Portugal	2	1	Unknown
Singapore		1	
South Korea	13	4	Unknown
Spain	2	2	Unknown
Sweden	7	5	Imported cases
Switzerland	69	49	Unknown
Taiwan	1		Imported cases
Thailand	3	3	
Turkey	2	4	Unknown
UAE		5	
USA	30	9	Community transmission
Vietnam	1		Imported cases
Zambia	22	31	Unknown
Total	943	569	

Table 1: International cases S. African variant (Data source – UK Variant and Mutation Taskforce slides 18/02/21)

There have been 235 confirmed or probable cases of B.1.351 in the UK (to 17/02/2021); England = 201; Scotland = 17; Wales = 17; Northern Ireland = 0.

1.2 Brazilian P.1 Variant

International epidemiology of the Brazilian variants (P.1 – variant of concern; P.2 – variant of interest)

Table 2 presents the international detected cases of the Brazilian P.1 variant of concern

Country	Total cases reported in media or via IHR/EWRS	Confirmed sequences in GISAID	Cases imported or evidence of local/community transmission
Argentina	2**		Community transmission
Belgium	5	3	
Canada	1**		Imported case
Colombia	2	9	Unknown
Faroe Islands	1	1	Imported case
France	3	6	
French Guiana		2	
Germany	3		Imported cases
India	1		
Italy	12*	3	Unknown
Japan	4	7	Imported cases
Luxembourg	1		
Mexico		1	
Netherlands	3	2	Unknown
Peru	1	1	Unknown
South Korea	1 (4*)	1	Unknown
Spain	1*	1	Imported case
Switzerland	1	9	
Turkey	1*		Unknown
USA	3	3	Community transmission
Total	50	49	

Table 2: International cases Brazilian P.1 variant of concern (Data source – UK Variant and Mutation Taskforce slides 18/02/21)

1.3: Recommendations to enlarge list of category 2 countries

Close links exist between Portugal and South American countries, and frequent associated travel between the two. Whole genome sequencing capacity in many countries internationally is limited and therefore true understanding of the prevalence of the Brazilian P.1 variant of concern will have limitations. Therefore, it is recommended that Portugal and the countries of South America are added to the list of category 2 countries, to better try and identify and reduce the onward spread of this variant of concern.

For further countries, an Impact Assessment needs to be undertaken on the possible increased demands placed on Departments of Public Health and the Contact Tracing Teams as to their capacity to respond to resultant notifications, enhanced contact tracing and any necessary source investigation.

Section 2: Variant of Concern Covid-19 cases in Ireland

2.1: South African Variant Covid-19 cases in Ireland

(Based on NVRL results up to 22nd February 2021)

Confirmed B1.351 cases (new in the last week): **12 (1)**

Probable cases (new in the last week): **7 (2)**

Prior to the week commencing 22nd February 2021, all **confirmed** and **probable** cases had been identified and followed up through CTCs initially or Departments of Public health and appropriate public health actions undertaken.

2.2: Brazilian variant of concern cases in Ireland

Confirmed cases of Brazilian P.1 (variant of concern) **3 (3)**

Follow-up of all close contacts is ongoing and enhanced Public Health measures have been implemented, where possible.

2.3: "Potential" variants of concern cases in Ireland

Over the last 2 weeks, the Biomnis laboratory has contacted both the DPHs in the East and in the West, with regards to a further 7 "potential VOCs". The VOC operational team has been working to elucidate the testing performed on these samples and the definition used for "potential VOCs". The testing assays are the same as utilised in the NVRL but they are on an unselected patient population, with no epidemiological history. Therefore, concern

remains as to the probability that these will turn out to be VOCs, and the immense resource strain these actions for VOCs causes the Departments of Public Health.

Section 3: B1.525 Variant Under Investigation (VUI)

This strain of SARS-CoV-2 was first detected on 15th December, 2020, initially being reported in Nigeria, Ghana, the UK and France. It was designated a VUI in the UK on 12th February, 2021.

This lineage has the E484K, Q677H and F888L mutations and a similar suite of deletions to B.1.1.7. and other VOCs (69/70, 144, and the nsp6 del) but not 501Y or other VOC changes. The E484K mutation results in weaker neutralisation by antibodies and reduced drug susceptibility.

Cases reported to 22nd February 2021:

Country	Confirmed sequences in GISAID
Denmark	59
United Kingdom	53
Nigeria	31
USA	18
Canada	7
France	6
Ghana	5
Japan	4
Australia	3
Jordan	2
Italy	2
Netherlands	2
Mayotte	1
Belgium	1
Singapore	1
Finland	1
Spain	1
Total	197

Table 3: Cases of B1.525 reported internationally (Data source - <https://www.gisaid.org/hcov19-variants> 22/02/21)

Several cases in the UK and Denmark have travel links with Nigeria, Ghana and Dubai.

The overall frequency of the lineage, defined as the number of sequences assigned the lineage divided by the total number of sequences from that country in the time since the variant was first sequenced in that country.

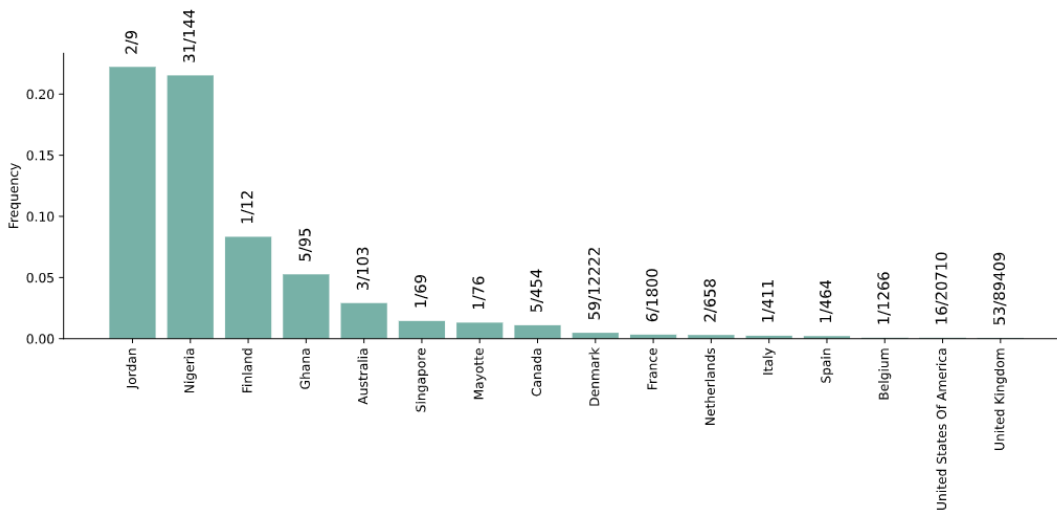


Figure 1: Frequency of B.1.525 in sequences produced since first report

Section 4: CTC / CMP update Brazil / South Africa Travel-related Cases / Close Contacts

4.1. Identification of Cases

This report provides results of the identification process that commenced on 15th January 2021 up to 9.00am on 22nd February 2021.

Potential cases of the Variants of Concern (VOC's) are identified are through a combination of referrals through Healthlink and notification of cases from the Routine Queue of the CCT System to the Specialised Queue managed by UCD CTC on behalf of Public Health. These processes are outlined in detail below.

4.2 Consolidation and Distribution of Information

The HSE IIS Team circulates a data extract from Healthlink of cases of Covid-19 linked to the Brazil and South Africa travel testing categories. This is sent on a daily basis to Public Health leads, UCD CTC, NVRL, Laboratory Operations Team and HSE Test and Trace Project Management representatives. Additional cases identified by the UCD CTC are manually added to the list and re-circulated to the above group. This allows for cases identified by both the Healthlink referral categories and Contact Tracing to be consolidated. Data are provided in Table 5. Samples are sourced by the Laboratory Teams and delivered to NVRL laboratory for WGS to test for the Variants of Concern (VOC). All samples for which WGS is warranted are either currently at the NVRL or are en route to the NVRL for this analysis.

Table 4 presents the number of potential cases of VOC among those who had a history of travel from countries of concern within 14 days of the onset of Covid-19, or close contact with a person with a history of travel from countries of concern within 1 month of the onset of Covid-19 in the case. Also presented are the number of VOCs confirmed by Whole Genome Sequencing (WGS) among those cases.

	Brazil	South Africa	Other Countries of Concern
Travel-related Referrals for Testing identified through Healthlink	1815	398	
Travel-related Positive Results (Cases) identified through Healthlink	72	11	
Travel-related Positivity Rate for Cases identified through Healthlink	3.97%	2.76%	
Additional Cases identified through CMP Contact Tracing	37	10	7*
Total Travel-Related Cases	109	21	7*
Travel-related VOC (Variant of Concern) Detected by WGS, NVRL	3	11	0*

Table 4: Travel-Related cases and Variant Testing outcome to 09:00am 22nd February 2021

* Of the **“Other Countries of Concern”** the cases identified through CMP Contact Tracing include: 1 x Tanzania, 1 x Democratic Republic of Congo and 4 x United Arab Emirates.

Of note is that 60% of all cases (83/137) were identified through Healthlink. The remaining 40% (54/137) relies on identification of such cases through the CTCs of Contact Management Programme.

Figure 2 and 3 below presents the numbers of Brazil and South Africa travel-related referrals through Healthlink only by week to date.

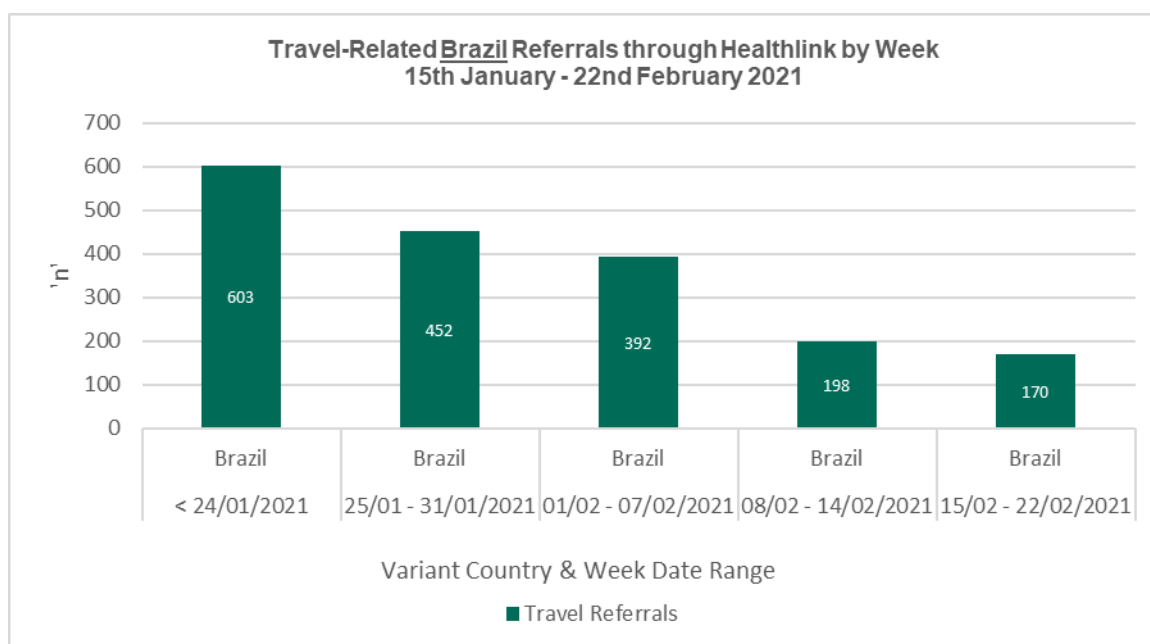


Figure 2: Travel Related Brazil Referrals through Healthlink ONLY by week to 09:00am 22nd February 2021

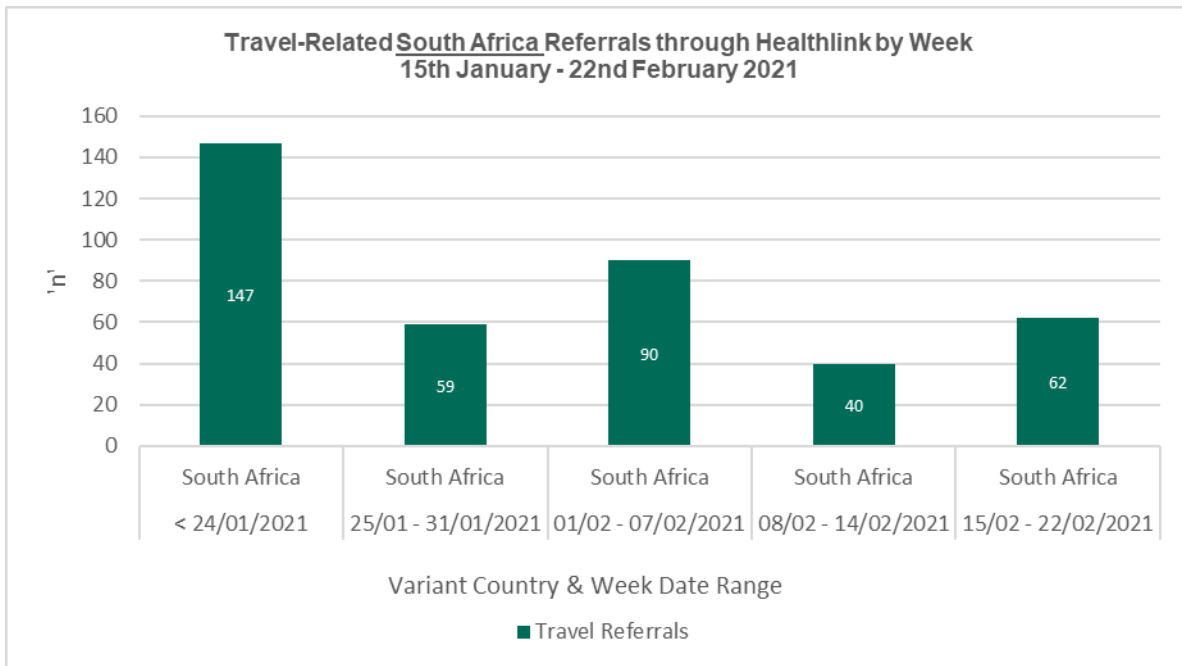


Figure3: Travel Related South Africa Referrals through Healthlink only by week to 09:00am 22nd February 2021

The number of referrals through Healthlink with a history of travel from Brazil only has decreased steadily over the period. There is some variation in referrals with a history of travel from South Africa.

Figure 4 and 5 presents the number cases with a history of travel from Brazil and South Africa identified through Healthlink and CMP combined by week to date.

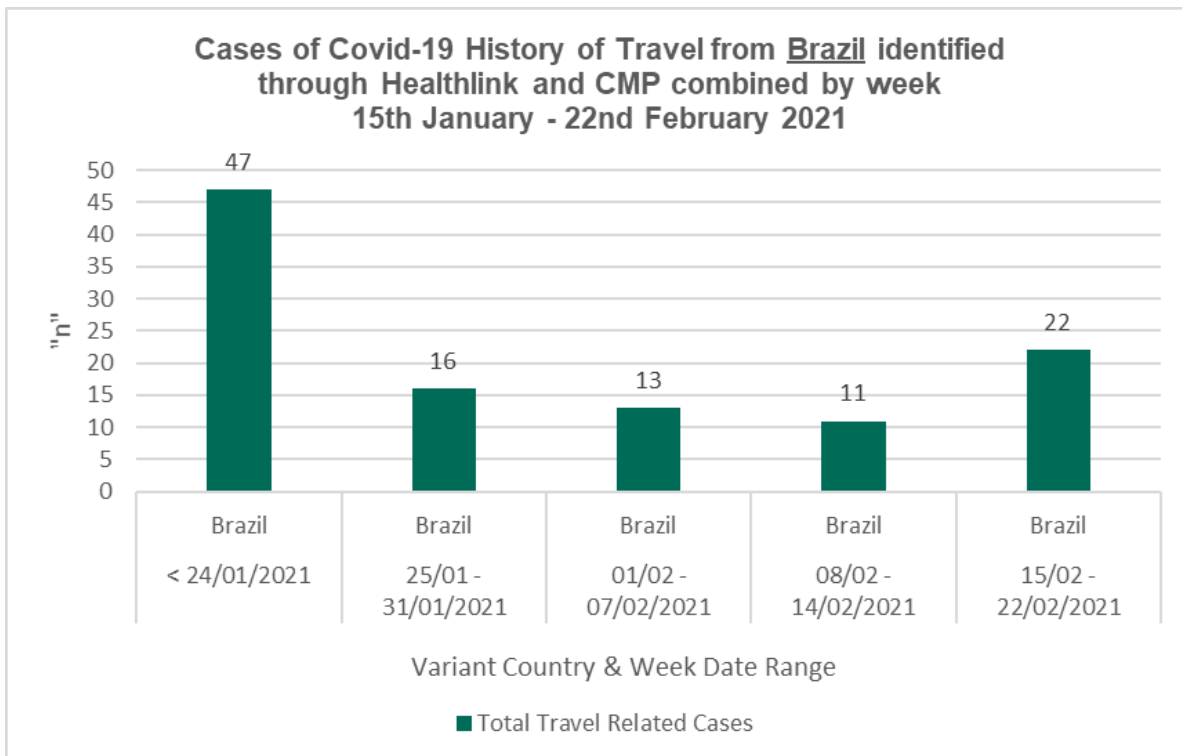


Figure 4: Cases of Covid-19 with History of Travel from Brazil only identified through Healthlink and CMP combined, by Week

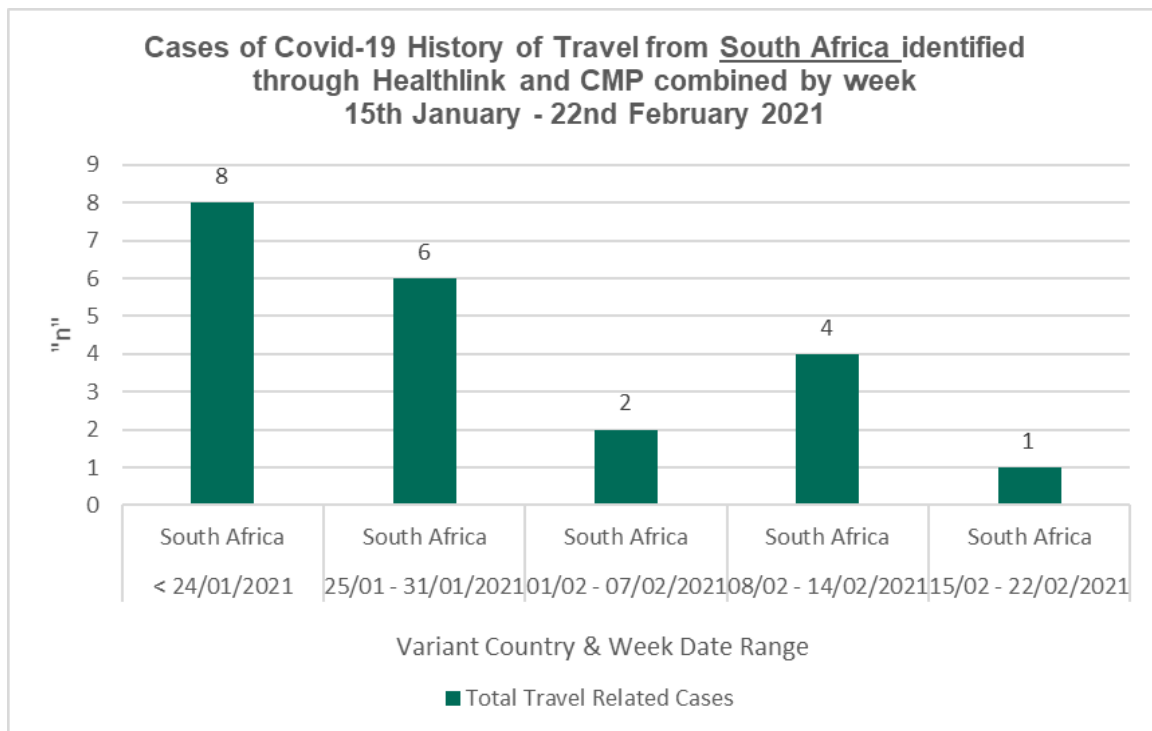


Figure 5: Cases of Covid-19 with History of Travel from South Africa only identified through Healthlink and CMP combined, by Week

4.4 Contact Tracing

The Contact Tracing Team in UCD undertakes enhanced contact tracing of relevant travel-related cases and their close contacts. In addition, an exposure investigation is entered for any eligible flights relating to countries of concern. An update on these activities is provided below:

4.4.1 Contact Tracing of Cases and Close Contacts

All cases of Covid-19 are entered into the Routine Queue (RQ) of CovidCare Tracker (CCT) system. Cases with a history of travel from any of the countries of concern within 14 days prior to testing positive for Covid-19 (or 14 days prior to symptom onset, if symptomatic); or cases who have been in close contact with a person with a history of travel from countries of concern within 1 month of the onset of Covid-19 in the case, routed to the Specialised Queue (SQ) for enhanced Contact Tracing and routing to NVRL for WGS by UCD.

Of cases for whom Contact Tracing complete:

- Detailed travel history has been established in so far as possible (dates, route, flight numbers, seat numbers). Further details may be required for some cases if identified as having a VOC.
- Close contacts of cases have been identified and scheduled for testing, self-isolation advice has been provided, and contacts have been advised to advise their household members to restrict their movements for 14 days.
- Exposure Investigations have been created for flights undertaken during infectious period (n=17)
- Passenger details from flight manifests are sourced by the Data Processing Team (DPT). The passenger details for 8 flights have been provided so far. Table 5: Exposure Investigation of Eligible Flights

Contact tracing has been completed for all passengers who could be contacted. Reasons for being uncontactable include: no number given; wrong number; international number provided not answered; or occasionally number provided for booking agent.

For those who could be contacted tests were scheduled, self-isolation advice provided and household contact advice provided.

4.4.3 Issues arising from Exposure Investigation of Eligible Flights

Of note are the lengthy time intervals from flight arrival date to enhanced contact tracing.

- Time interval from date of flight to date of contact tracing (past 4 weeks):
 - Week 25.01 (11 days)
 - Week 01.02 (8 days)
 - Week 08.02 (9 days) & (10 days)
 - Week 15.02 (9 days) & (9 days)

- These are a combination of:
 - The interval to case identification – usually identified on a Day 5 post-arrival test if asymptomatic;
 - The interval for result reporting, creation of the case in the CCT, contact tracing and creation of an Exposure Investigation for the flight;
 - The request by PH Data Processing Team to the airline for flight manifest;
 - Time taken for an airline to provide the flight manifest.
 - Cross-checking of flight manifest with e-PLFs

Contacts who remain un-contactable following multiple call attempts are forwarded to Public Health Data Processing (PH DP). These contacts are emailed (if email addresses are available) in order to ascertain updated contact information, and any new contact information is subsequently provided to UCD CTC for further call attempts. Consideration also given to arrange testing for those with valid phone numbers who have not been reached supported by Public Health.

4.4.4 Enhanced contact tracing & follow-up of flight linked to confirmed VOCs

Issues arising:

- Poor or incomplete information provided by passengers on the ePLF. This included:
 - Variations in names provided
 - Unanswered calls
 - Incorrect contact numbers
 - Contact numbers not in use
 - International telephone numbers not answered due to charges or other reasons
 - Incomplete addresses/no address providedFor consideration, making address and telephone number fields on e-PLF mandatory fields. Also, do passengers receive a confirmatory SMS message once the form is completed and submitted? This would verify the telephone number
- Mixed adherence to HSE requests for passengers to attend for initial Day 10 testing & subsequent follow-up screening tests (16/02/2021 to present).

4.5 Variant Detection & Public Health Response

All detected positive samples identified by GP Healthlink referrals and UCD Contact Tracing Centre are routed to NVRL for whole genome sequencing to detect the Variant of Concern.

On conclusion of NVRL genome sequencing, all results are communicated to Public Health who contact the individual in question.

- If the VoC is present in the sample, Public Health will communicate with the individual and initiate a Stand Up Process which will involve increasing the individual's isolation restrictions.
- If the VoC is not present in the sample, Public Health will communicate with the individual and initiate a Stand Down Process which will involve decreasing the individual's isolation restrictions.

Going forward following PCR assays, step down processes will be undertaken if there is no probable VOC.