

# RECOMMANDATIONS CONCERNANT LE DÉPISTAGE DES VOYAGEURS ENTRANTS PAR DES TESTS AG - MISE À JOUR OCTOBRE 2021

## RAG sousgroeep Testing – 18 Octobre 2021

Note : Les recommandations actuelles sont susceptibles d'être modifiées en fonction de nouvelles informations et/ou de l'évolution de l'épidémie

*Attention: Le CIM et le RMG n'ont pas suivi toutes les recommandations du RAG, et ont apporté des modifications au calendrier des tests proposé. La décision finale est de suivre le même calendrier pour les tests Ag que pour les tests RT-PCR, et donc pas de test supplémentaire le jour 3 ou le jour 4. La période de validité d'un test Ag avant le retour/l'arrivée a été rendue égale à la période de validité pour la participation à un événement, c'est-à-dire jusqu'à minuit le jour suivant le test.*

### Principales recommandations :

Concernant les tests avant le retour/ l'arrivée en Belgique :

- Pour les tests effectués avant un voyage en Belgique, lorsque la preuve d'un résultat négatif est requise, un test Ag est une alternative acceptable à la RT-PCR actuellement requise.
- La période de validité doit être plus courte que celle de la RT-PCR ( $\leq 72$  heures). La durée recommandée est  $\leq 24$  heures avant le départ.

Concernant les tests après l'arrivée en Belgique :

- Tous les voyageurs arrivant ou revenant d'un pays où la circulation d'un VOC nouvellement apparu est connue ou suspectée doivent toujours être testés par RT-PCR pour permettre le séquençage.
- Du point de vue de la santé publique, il reste recommandé que tous les voyageurs arrivant d'autres pays/zones pour lesquels un test post-arrivée est indiqué, soient testés par RT-PCR.
- Toutefois, si pour des raisons autres que de santé publique, il est décidé d'arrêter les tests par RT-PCR, les tests par Ag sont acceptables, à condition que :
  - Pour les voyageurs qui ne vont pas en quarantaine, un premier test est effectué peu après l'arrivée, même si le voyageur a déjà été testé avant l'embarquement.
  - Pour les voyageurs en provenance de pays non classés comme pays VOC et nécessitant une quarantaine (actuellement les voyageurs non entièrement vaccinés en provenance de pays non membres de l'UE/Schengen), et qui ont déjà été testés avant l'embarquement, un seul test au jour 7 avec un test RT-PCR suffit.
  - Tous les résultats positifs doivent être confirmés par RT-PCR.

## Proposition de calendrier des tests:

Arrivant de:	Statut vaccinal	Statut de résident	Avant l'embarquement	Après l'arrivée	Quarantaine	Après jour 7
Zones rouges dans les pays de Zones rouges dans les pays de l'UE/Schengen/liste blanche	Entièrement vacciné	Tous	Aucun test requis	Aucun test requis	Non	Aucun test requis
	Non entièrement vacciné	Résidents belges	Option 1: PCR<=72h	Aucun test requis	Non	Test PCR jour 7
			Option 2: Test Ag<=24h	Test Ag jour 3	Non	Test Ag jour 7
			Option 3: Pas de test	Test PCR jour 0	Non	PCR ou test Ag jour 7
			Option 4: Pas de test	Test Ag jour 0 et jour 4	Non	PCR ou test Ag jour 7
	Non-résidents belges	Option 1: PCR<=72h	Aucun test requis	Non	Test PCR jour 7	
Option 2: Test Ag<=24h		Test Ag jour 3	Non	Test Ag jour 7		
Pays non-UE/Schengen/liste blanche	Entièrement vacciné	Tous	Aucun test requis	Option 1: Test PCR jour 0	Non	Test PCR ou test Ag jour 7
				Option 2: Test Ag jour 0 et jour 4	Non	PCR ou test Ag jour 7
	Non entièrement vacciné	Tous	Aucun test requis	Option 1: Test PCR jour 0	Oui	Test PCR ou test Ag jour 7
				Option 2: Test Ag jour 0 et jour 4	Oui	PCR ou test Ag jour 7
Pays classés comme "pays VOC	Entièrement vacciné	Tous	Aucun test requis	Test PCR jour 0	Oui	Test PCR jour 7
	Non entièrement vacciné	Tous	Aucun test requis	Test PCR jour 0	Oui, 10 jours	Test PCR jour 7

### Les personnes suivantes ont participé à cet avis :

Emmanuel Bottieau (ITG/IMT); Laura Cornelissen (Sciensano); Olivier Denis (CHU-UCL Namur); Yves Lafort (Sciensano); Tinne Lernout (Sciensano); Elizaveta Padalko (UZGent); Patrick Smits (AZG); Ann Van den Bruel (KU Leuven); Olivier Vandenberg (LHUB-ULB); Steven Van Gucht (Sciensano).

## CONTEXT

A RAG advice on the overall test strategy for detecting COVID-19 in symptomatic people, contacts and travelers is currently in the process of being finalized. With regards to travelers, the question was raised if the cost of testing could be reduced by a wider use of rapid Ag tests instead of RT-PCR. The RAG Testing was therefore requested to update the latest advice on the type of tests to use in travelers returning or arriving from areas for which a testing requirement exists.

## BACKGROUND

### Current advice

The latest advice dates March 3, 2021<sup>1</sup>. The recommendation was that the procedure of testing resident travelers returning from a red zone with an RT-PCR, asap after their return, remained the preferred strategy. Ag tests could, however, be an alternative but only if for some reason (insufficient PCR testing capacity, too high cost of PCR testing) it is no longer possible to test all returning travelers within reasonable time with an RT-PCR.

Ag testing at the point of entry could only be considered if the logistics were carefully organized to ensure physical distancing, the protection of staff at all times, sufficient quality of the tests performed and reasonable waiting times.

A sufficient proportion of travelers returning from a red zone needed to be tested with an RT-PCR for sequencing purposes.

### Current traveler testing procedures

The current testing strategy in returning residents and arriving nonresidents depends on the country coming from and on the vaccination/recovery status:

- Fully vaccinated travelers only have to test when coming from a red non-EU/Schengen/white list country
- Non-fully vaccinated travelers, without a recovery certificate, also have to test when coming from a red EU/Schengen/white list zone
- The testing procedures are:
  - Belgian residents have a first test ASAP after arrival (day 0) (or optionally a pre-travel negative test if coming from an EU/Schengen/white list country)
  - Non-Belgian residents must have a pre-travel negative test if coming from an EU/Schengen/white list country, or, if coming from another country, a first test ASAP after arrival
  - All have a second test on day 7

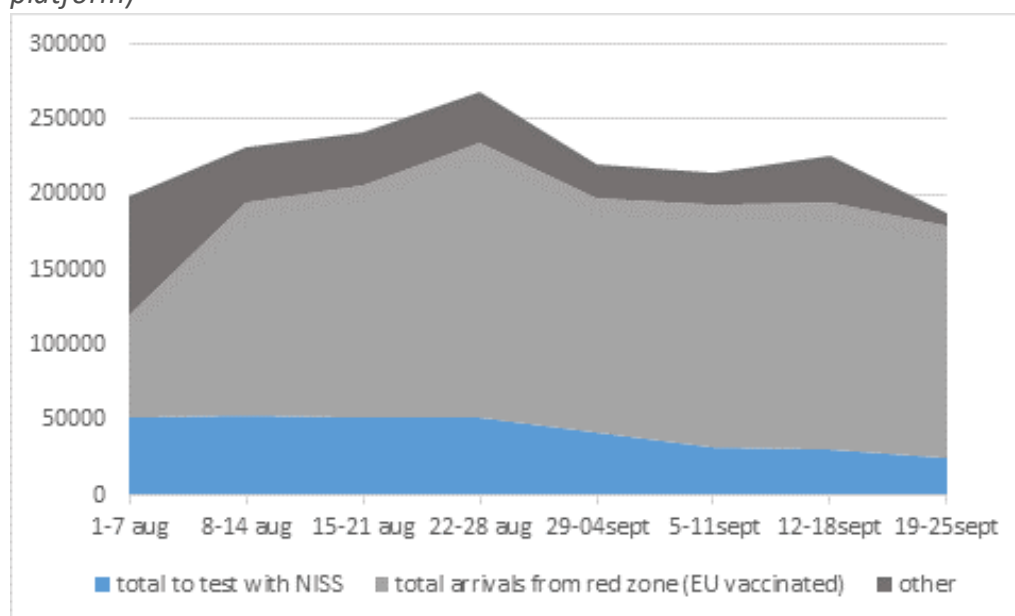
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<sup>1</sup> See : [20210303\\_Advice RAG\\_Testing of travelers\\_NL.pdf \(sciensano.be\)](#) or [20210303\\_Advice RAG\\_Testing of travelers\\_FR.pdf \(sciensano.be\)](#)

### Current number of incoming travelers requiring testing

The average number of arrivals from red zones (both EU and non-EU) in September 2021 was 209,224 travelers/week, of which 38,549 were identified as needed to be tested (blue area in figure below). The remaining are either fully vaccinated travelers coming from EU red zones who are exempt from testing (light grey area) or travelers from red zones who required testing but for whom no test result is available (dark grey area). These are mostly travelers whose test result could not be linked because an NISS was lacking (e.g. foreign residents), but also includes people who did not test.

**Number of arrivals in Belgium from Red zones, August-September 2021** (Source: Paloma platform)



Among the travelers who received a code for a test in September, 32,458 (84%) performed at least one test. This is usually the test on day 0, but is in some cases (when having proof of a negative test before returning, and no test on day 0 is needed) the test on day 7. Sixty percent of travelers having a first test on day 0 had a second test on day 7. The average total number of weekly tests performed among travelers was in September 45,216, of which 28,471 on day 0 and 16,745 on day 7. The large majority (97%) of reported test results was in Belgian residents. Slightly more than half (58%) were fully-vaccinated (and thus returning from a red non-EU/Schengen/white list country). The majority (85%) of tested travelers arrived from non-EU countries (with in order of importance (1) Morocco (26% of all tested travelers); (2) Turkey (24%) and (3) the UK (9%)).

The PR of the 1<sup>st</sup> test was 1.5% at the end of September. The PR of the 2<sup>nd</sup> test is similar to the PR of the 1<sup>st</sup> test. It has to be observed though that the denominator is not the same, because some travelers only have one test. The number of weekly positive tests is thus around 650-700.

## Current number of positive results among travelers that is sequenced

According to the NRC data, the average number of samples referred in the context of travel for which whole genome sequencing was performed was on average 154/week in September, with a decreasing trend.

## SUMMARY ARGUMENTS PRO AND CONTRA THE USE OF AG TESTS

The arguments pro and contra the use of rapid Ag tests are still greatly the same as in March 2021, with the difference that testing immediately upon arrival (at the airport or train station) is no longer considered (although not excluded).

### Arguments in favor of using a rapid Ag test

- Cost saving
- Can provide a faster result

### Arguments in disfavor of using a rapid Ag test

- Sample can no longer be sequenced for the detection of new variants (as is currently indicated for travelers returning from a red zone)
- Lower sensitivity and specificity compared to an RT-PCR, particularly in asymptomatic people
- Less suited for quickly testing high volumes of people, as more man-power per test needed.
- Advantage of a faster result is less valid if test cannot be performed at the point of entry
- Having a different test used in returning travelers than in high-risk contacts is confusing, considering that both are tested for the same reason (asymptomatic and been at risk for infection)

### Other considerations

- Another test procedure that could be considered is using automated antigen testing, as is currently done in some airports. These tests may have a better performance than rapid Ag tests (although still less than an RT-PCR), and can provide results in one hour time. It implies, however, new infrastructures and skilled staff.
- The previous advice concerned only the first test after arrival. For the second test on day 7 the recommendation was to use RT-PCR.
- The current request for advice concerns not only the use of Ag tests for returning/ arriving travelers after their arrival, but also for pre-travel tests. The current guideline for a negative test result required before travelling, is that it has to be a PCR test. A rapid Ag test has a shorter validity period, and when accepting a rapid Ag test this should be taken into account.
- Test done before departure from the country traveling from
  - A test before departure:

- Ensures also safe travel (avoids transmission during travel)
    - Less control over the quality of the test
    - More cumbersome for residents, easier for non-residents
  - If a pre-travel test was done, the risk of being positive upon or soon after arrival is low and a first test immediate after arrival is less relevant
- Objective(s) of the testing.
  - To ensure safe travel?
  - To rapidly detect people who might have been infected just before or during travel? (only relevant if no pre-travel test was done)
  - To rapidly detect VOCs
- Vaccination status
  - Fully vaccinated travelers have less risk to be infected during travel and upon or soon after arrival
- Quarantine
  - If no quarantine period is applied, testing upon arrival becomes more important and the second test needs to be done in function of the quarantine period

## DISCUSSION

- The choice of test depends on the purpose of the testing:
  - If it is to secure safe travel (not contaminating other travelers), an Ag test is fully acceptable.
  - If it is to detect new VOCs, an RT-PCR test is necessary.
- There was agreement that for pre-travel tests an Ag test is an acceptable alternative.
- The validity period is best the same as currently applied for pre-event screening (24h, extended to the end of the next day).
- Travelers arriving/returning from a country where a new VOC is known or suspected to circulate (and thus classified as 'VOC country'), should after arrival always be tested with RT-PCR. There are currently no such countries, but they might appear.
- Also travelers arriving from other countries/ zones for which testing after arrival is indicated are best tested with RT-PCR, but if there are other than epidemiological reasons (too high cost, alignment with other countries,...) Ag tests may be acceptable, but under certain conditions:
  - Even when a pre-travel Ag test was done, a first test should be done soon after arrival, ideally within less than 2 days, certainly within less than 5 days. If a test is done within 2 days, a second test could be done later, for example on day 5. However, not to deviate too much from the current procedures and from the PCR test procedure, a first test on day 3 and a second on day 7 might be more practical.
  - Positive Ag tests should be confirmed with RT-PCR.

- For unvaccinated travelers from non-EU red countries, who are required to go into quarantine, a test on day 3 might be less useful and a sole test on day 7 with a PCR test might be sufficient.

## RECOMMENDATIONS

### With regards to pre-travel testing:

- For testing before traveling to Belgium, when proof of a negative test result is required, an Ag test is an acceptable alternative to the currently required RT-PCR.
- The validity period should be shorter than the one for RT-PCR ( $\leq 72$  hours). It is recommended that it be  $\leq 24$  hours before departure.

### With regards to post-arrival testing:

- All travelers arriving/returning from a country where a newly arising VOC is known or suspected to circulate should always be tested with RT-PCR to allow sequencing. They are recommended to be tested twice: a first test as soon as possible after arrival, and a second test on day 7.
- From a public health point of view, it remains recommended to test all travelers arriving from other countries/ zones for which testing after arrival is indicated with RT-PCR.
- However, if for other than public health reasons the decision is taken to no longer test with RT-PCR, testing with Ag tests is acceptable as long as:
  - For travelers who do not go into quarantine, a first test be taken soon after arrival, even when the traveler was already tested pre-travel. Ideally two tests are taken (one on day 3 and a second one on day 7).
  - For travelers coming from countries that are not classified as VOC-countries and for which quarantine is required (currently non-fully vaccinated travelers coming from non-EU/Schengen red countries), only to test once on day 7 with an RT-PCR test.
  - All positive test results be confirmed with RT-PCR.

## BACKGROUND LITERATURE

### Scientific literature

A literature review on the effectiveness of international travelers test strategies is available in the upcoming RAG advice on the test strategy, and is copied below. However, there is little scientific literature on the use of rapid Ag test vs. RT-PCR. One modeling study compared the reduction of the number of infectious days (the number of days that travelers are infectious after arrival) when tested with PCR with when tested with a rapid Ag test **(1)**. Pre-travel **PCR** testing **reduces the number of infectious days with 36%** (29–41) compared with no testing **and identifies 88%** (76–92) of actively infectious travelers on the day of flight. If the pre-travel

screening is done with a **rapid Ag test**, the reductions are **32%** (26–38) **and 86%** (83–89), respectively. Adding post-travel quarantine and PCR reduces the number of infectious days further to **82%** (80–84), and using a rapid Ag test to **70%** (67-72).

Several mathematical modeling and some observational studies have been published with regards to effectiveness of strategies of testing international travelers in reducing the spread of COVID-19. However, almost all of these date from the era before vaccination roll-out and Delta predominance, and extrapolation to the current context is risky. In addition, the few ‘real-world’ experiences are each in a particular context. A Cochrane review of 13 modelling studies and 13 observational studies therefore concluded that these studies only provide ‘low-certainty evidence’ (2). Nevertheless, there is consensus that testing international travellers will likely reduce viral spread.

Observational studies generally show that most positive cases are detected by testing upon arrival, although that still an important number are additionally detected by a second test later on. For example, a study among 16,361 arriving international travelers at Toronto airport who were tested on day 0, day 7 and day 14 found that, of the 248 detected cases, 67% had tested positive on day 0, 27% on day 7 and 6% on day 14 (3). In a similar study among 2714 arriving international travelers at Bahrain International Airport, who were tested upon arrival and at the end of a 14-day quarantine period, unless they presented symptoms before, 188 tested positive of which 136 upon arrival (72%) and the remaining during or at the end of the quarantine period (4).

Some modelling studies have compared different test strategies. Kiang et al. estimated that pre-travel PCR testing reduces the number of infectious days (the number of days that travelers are infectious after arrival) with 36% (29–41) compared with no testing and identifies 88% (76–92) of actively infectious travelers on the day of flight (1). Adding post-travel quarantine and PCR reduces the number of infectious days further to 82% (80–84). If the pre-travel screening is done with a rapid Ag test, the reductions are 32% (26–38) and 70% (67-72), without and with post-travel quarantine and PCR respectively, and the % identified 86% (83–89). Dickens et al. estimated that testing travelers upon arrival, followed by quarantine and a test on day 7, reduces case importation on average by 90.2% (5). This was similar to testing upon arrival, followed by quarantine and a test on day 14 (91.7%) and to a 14-day quarantine without testing (91.2%), but much higher than a 7-day quarantine without testing (55.4%) and higher than testing upon arrival without quarantine and second test (77.2%). Johansson et al. found that a quarantine of 7 days combined with symptom monitoring and a test on day 3-4 after arrival is highly effective (95-99%). With effective quarantine after arrival, testing a few days later optimizes sensitivity to detect those infected immediately before or while traveling (6). Taylor et al. found that, without quarantine, a single RT-PCR taken upon arrival at the airport is only 39.6% effective (7). Alternatively, testing four days after arrival is 64.3% effective whereas a test at the airport plus additional test four days later is 68.9% effective. Clifford et al. observed that a quarantine period of 8 days on arrival with a PCR test on day 7 can reduce the number of infectious arrivals released into the community by a median 94% compared to a no quarantine, no test scenario (8).



## International and national recommendations

The international recommendations with regards to testing international travelers of some agencies and in neighboring countries are summarized in the table in Annex.

In general, most countries focus more on pre-travel testing and less on immediately after arrival testing than Belgium. **Most countries allow rapid Ag test results.** Some apply different validity periods for Ag test results than for RT-PCR results, but some don't.

## REFERENCES

1. Kiang MV, Chin ET, Huynh BQ, Chapman LAC, Rodríguez-Barraquer I, Greenhouse B, et al. Routine asymptomatic testing strategies for airline travel during the COVID-19 pandemic: a simulation study. *Lancet Infect Dis.* 2021 Jul;21(7):929–38.
2. Burns J, Movsisyan A, Stratil JM, Biallas RL, Coenen M, Emmert-Fees KM, et al. International travel-related control measures to contain the COVID-19 pandemic: a rapid review. *Cochrane Database Syst Rev.* 2021 Mar 25;3:CD013717.
3. Goel V, Bulir D, De Prophetis E, Jamil M, Rosella LC, Mertz D, et al. COVID-19 international border surveillance at Toronto's Pearson Airport: a cohort study. *BMJ Open.* 2021 Jul 1;11(7):e050714.
4. Al-Qahtani M, AlAli S, AbdulRahman A, Salman Alsayyad A, Otoom S, Atkin SL. The prevalence of asymptomatic and symptomatic COVID-19 in a cohort of quarantined subjects. *Int J Infect Dis.* 2021 Jan;102:285–8.
5. Dickens BL, Koo JR, Lim JT, Sun H, Clapham HE, Wilder-Smith A, et al. Strategies at points of entry to reduce importation risk of COVID-19 cases and reopen travel. *J Travel Med.* 2020 Dec 23;27(8):taaa141.
6. Johansson MA, Wolford H, Paul P, Diaz PS, Chen T-H, Brown CM, et al. Reducing travel-related SARS-CoV-2 transmission with layered mitigation measures: Symptom monitoring, quarantine, and testing. *medRxiv.* 2020 Nov 24;2020.11.23.20237412.
7. Taylor RA, McCarthy C, Patel V, Moir R, Kelly LA, Snary EL. The risk of introducing SARS-CoV-2 to the UK via international travel in August 2020. *medRxiv.* 2020 Sep 9;2020.09.09.20190454.
8. Clifford S, Quilty BJ, Russell TW, Liu Y, Chan Y-WD, Pearson CAB, et al. Strategies to reduce the risk of SARS-CoV-2 importation from international travellers: modelling estimations for the United Kingdom, July 2020. *Eurosurveillance.* 2021 Sep 30;26(39):2001440.

## ANNEX: INTERNATIONAL AND NATIONAL TRAVELER TESTING GUIDELINES

Country/agency	Coming from	Vaccination status	Residence status	Before travel	Immediately after arrival	Later after arrival
Belgium	red zone EU/ Schengen/ white list	not vaccinated	resident	Optional PCR <=72h before departure	PCR on day 0	PCR on day 7
Belgium	red zone EU/ Schengen/ white list	not vaccinated	non-resident	PCR <=72h before departure	-	PCR on day 7
Belgium	red non-EU/ Schengen/ white list country	vaccinated	resident	-	PCR on day 0	PCR on day 7
Belgium	red non-EU/ Schengen/ white list country	vaccinated	non-resident	-	PCR on day 0	PCR on day 7
Belgium	red non-EU/ Schengen/ white list country	not vaccinated	resident	-	PCR on day 0	PCR on day 7
Belgium	red non-EU/ Schengen/ white list country	not vaccinated	non-resident	-	PCR on day 0	PCR on day 7
ECDC	high-risk countries	NA	both	<=48 hours (type of test not specified)	If no pre-travel test	Test on day 5-7
EC	non-green zone EU	not vaccinated	both	PCR or Ag test	NS	NS
EC	high-risk non-EU countries	both	both	PCR <=72h before departure	NS	NS
The Netherlands	non-green countries	not vaccinated	both	PCR <=48h or Ag test <=24h before departure	Optionally a selftest on day 2	Optionally a selftest on day 5
The Netherlands	non-EU/Schengen countries	not vaccinated	both	PCR <=48h or Ag test <=24h before departure	Optionally a selftest on day 2	Optionally a selftest on day 5
The Netherlands	non-green countries	vaccinated	both	-	Optionally a selftest	-
The Netherlands	non-EU/Schengen countries	vaccinated	both	-	Optionally a selftest	-
France	Green countries	not vaccinated	both	PCR or Ag test <=72h before departure	-	-
France	Orange countries	not vaccinated	both	PCR <=72h or Ag test <=48h before departure	Randomly with Ag test	-
France	Red countries	not vaccinated	both	PCR or Ag test <=48h before departure	Ag test on day 0	-
France	Green countries	vaccinated	both	-	-	-
France	Orange countries	vaccinated	both	-	-	-
France	Red countries	vaccinated	both	-	-	-
Germany	All non-high risk countries	not vaccinated	non-resident?	PCR <=72h or Ag test <=48h before departure	-	-
Germany	High-risk countries	not vaccinated	non-resident?	PCR <=72h or Ag test <=48h before departure	-	Test >= day 5
Germany	All countries	vaccinated	both	-	-	-
United Kingdom	Non-red countries	vaccinated	both	-	PCR or Ag test or LAMP <= day 2	-
United Kingdom	Red countries	vaccinated	both	-	PCR or Ag test or LAMP <= day 2	PCR or Ag test or LAMP on day 8
United Kingdom	All countries	not vaccinated	both	PCR or Ag test or LAMP <=72h before departure	PCR or Ag test or LAMP <= day 2	PCR or Ag test or LAMP on day 8
United States	All countries	both	both	PCR or Ag test <=72h before departure	-	PCR or Ag test on day 3-5