

## **High prevalence of SARS-CoV-2 infection in repatriation flights to Greece from three European countries**

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**Highlight**

Passengers on repatriation flights to Greece from the UK, Spain and Turkey were screened with oropharyngeal swabs on arrival for SARS-CoV-2 infection. Despite almost all passengers being asymptomatic, many tested positive (3.6% from UK, 6.3% from Spain and 6.3% from Turkey), indicating widespread transmission of SARS-CoV-2 in these countries.

**Keywords**

COVID; pandemic; coronavirus; air travel; asymptomatic transmission; screening; real-time PCR

As the novel coronavirus (COVID-19) pandemic spread worldwide in March 2020, several European countries implemented travel restrictions. As a result, governments organized repatriation flights for their citizens living abroad who wished to return. In Greece, the National Public Health Organization (NPHO) and the General Secretariat for Civil Protection (GCSP) decided to screen with oropharyngeal swabs all repatriated passengers from certain countries with presumed widespread SARS-CoV-2 infection. In particular, three flights from London, United Kingdom on 20 March, three flights from Barcelona and Madrid, Spain on 21-23 March and one flight from Istanbul, Turkey on 25 March, were selected for screening. All passengers consented to screening, and were asked in-flight to fill in a paper form with demographic, clinical and contact information. A temporary facility was set up by NPHO at a gate in Athens airport “Eleftherios Venizelos”, and swab samples were obtained from passengers immediately upon arrival; those not in need of medical care were subsequently requested to self-quarantine at home for 14 days. All passengers received written instructions to report any new symptoms to NPHO by telephone. For logistical reasons, passengers from Spain and Turkey were transferred to a requisitioned hotel, where they provided swab samples and were isolated there until a negative result was obtained, at which point they continued self-quarantine at home. All samples were examined for SARS-CoV-2 by Real-Time PCR in designated reference laboratories.

The passengers’ median age was 27 years (interquartile range 22–40 years). All passengers reported no general or respiratory symptoms on arrival, except one person from Spain who had a high fever and cough, was transferred to hospital, and tested positive for SARS-CoV-2. The results of the screening are summarized in Table 1. There was a remarkably high prevalence of SARS-CoV-2 infection in this cohort, despite the lack of symptoms: 3.6% (95% CI: 2.0–6.1%) in passengers coming from the UK, 6.3% (95% CI: 4.1–9.2%) in those from Spain, and 6.3% (95% CI: 0.8–20.8%) in those from Turkey. This indicates substantial community transmission of SARS-CoV-2 in these countries, with most infected persons likely showing no or mild symptoms. Indeed, at the time each repatriation flight occurred, the UK had reported just 3,983 confirmed COVID-19 cases with 177 deaths, Spain 28,603 cases and 1,756 deaths, and Turkey 2,433 cases and 59 deaths.<sup>1</sup> Even more remarkably, the infection prevalence in these passengers was much higher than in the repatriation flights from Wuhan during the peak of the epidemic there, which was reported as <1%.<sup>2</sup> It is also within the range estimated in a recent modelling study (for the UK and Spain).<sup>3</sup> Furthermore, as of 6 April, another 4 test-positive and 36 test-negative passengers reported new symptoms during their self-

quarantine (Table 1), almost exclusively fever and/or cough (37/40, 93%). Some of these patients could carry the virus and have contracted it abroad, further raising the infection prevalence, although no further tests are currently planned.

Our results suggest that the ascertainment rate of SARS-CoV-2 infection might be much lower than previously assumed, with a correspondingly lower Infection Fatality Rate.<sup>4</sup> At the same time, the extent of asymptomatic transmission is likely to make mitigation challenging without wide-ranging social distancing measures. Better epidemiological data must be urgently collected, including repeated seroprevalence surveys, to guide further management of this pandemic.

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## **Author contributions**

Original idea: ST, TL; data analysis: TL; data collection: AF, SH, GN, KT, ZD, GS, MT, GG, GR, SS; first manuscript draft: TL; revision of the manuscript for important intellectual content: all authors.

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## **Conflict of Interest**

The authors have declared no conflicts of interest.

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**Table 1: Oropharyngeal swab testing results in passengers repatriated to Greece, by country of origin, March 2020**

Country of origin	Dates repatriated	Passengers repatriated and tested	Total positive confirmed	Percent positive (95% CI)	Point tested	Total symptomatic, as of 6 April 2020 (of which test-positive*)
United Kingdom	Mar 20	357	13	3.6 (2.0–6.1)	Airport	10 (1)
Spain	Mar 21-23	394	25	6.3 (4.1–9.2)	Hotel	28 (4**)
Turkey	Mar 25	32	2	6.3 (0.8–20.8)	Hotel	3 (0)

\* Of five test-positive persons with symptoms, two reported loss of smell and taste (anosmia, ageusia)

\*\* Includes a single person who was already symptomatic on arrival, and tested positive for SARS-CoV-2 infection

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