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The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don’t know which ones.

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On the Front Cover

CENTER: A dead seagull entangled with a discarded pandemic-time face mask, both collected from a road in Rotterdam, The Netherlands. Photo: Erwin Kompanje.

TOP AND BOTTOM: Air exhaust patterns from the mouth of an opera singer. See page 28.

On the Back Cover


Some Coming Events

The Covid-19 pandemic has introduced excitingly boundless uncertainty as to whether, when, and where public activities will happen in the near future. In 2022 some will happen teledistantly.

See IMPROBABLE.COM for details of these and other events:

NOTE: The 2022 Ig Nobel Euro (and Brexitannia) Tour was, like the 2020 and 2021 tours, canceled because of the pandemic

Improbable Conversations with Researchers—

See schedule on the web site.

April 9, 2022—
TEDx IIITA, Allahabad, India

September, 2022—
The 32nd First Annual Ig Nobel Prize Ceremony

Where There’s More

There’s always new improbable — it’s not what you expect! — stuff on the Improbable Research blog at IMPROBABLE.COM

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Viruses Research Review: Group Sex, Singer, Saint, Count

Research that may pertain to viruses
by Ernest Ersatz, Improbable Research staff

Effect of the Covid-19 Pandemic on Group Sex


We sought to understand how the pandemic and associated public health control measures have affected group sex practitioners and activities. We used a community-based participatory research approach…. To be eligible, participants had to be at least 18 years old and have recently participated in a local group sex event (i.e., sex, broadly defined, with more than 3 people)…. In December 2019, participants were asked about definitions of group sex. In May 2020, participants were asked about COVID-19 impacts. Key informants shared that due to COVID-19 restrictions, group sex events were cancelled and participants only had sex with others they were isolating with…. Participants reported attending online group sex events (e.g., Zoom orgies) as well as skill-building classes (e.g., rope bondage). Participants anticipated in-person events in the future, but felt that moving online opened up new opportunities for community-building.

Tracking the Air Exhaled by an Opera Singer

"Tracking the Air Exhaled by an Opera Singer," Philippe Bourrianne, Paul R. Kaneelil, Manouk Abkarian, and Howard A. Stone, *Physical Review Fluids*, vol. 6, no. 11, 2021. The authors, at Princeton University and at the University of Montpellier, France, report:

We observed the air exhaled by a mezzosoprano singer during her performance of an Armenian lullaby "Oror." We use a high-speed infrared camera (FLIR X6900SC) operating in the midwave range of the infrared spectrum (1.5–5 μm). The use of a filter in the absorption range of CO2 (4.2 μm) enables tracking the warm exhaled CO2. The opera singer sat beside a dark nonreflective curtain that provided a uniform background at the ambient temperature. As seen in the image sequence of Fig. 1, the infrared imaging captures the warm face of the singer and the warm exhaled CO2. The spatial extent of the exhaled CO2 can, thus, be estimated.
Saint Choice and the Fight Against Covid-19

"Which Saint to Pray for Fighting Against a Covid infection? A Short Survey," A. Perciaccante, A. Corallic, and P. Charlier, Ethics, Medicine and Public Health, vol. 18, September 2021, 100674. (Thanks to Andrea Rapisarda for bringing this to our attention.) The authors, at Paris-Saclay University (UVSQ), France, and Azienda Sanitaria Universitaria Giuliano Isontina, Italy, explain:

In the absence of a treatment still considered universally effective, and of a vaccine validated by the health authorities, we wanted to know which Catholic saint the European Christian community turned to in the event of infection with Covid-19 to request a miraculous healing.

Methodology—An online survey was carried out on a sample of 1158 adults using social media tools.

Results—All results are presented in this research, with a few saints in the majority, and some dictated by the symptomatology of the Covid-19 infection or the personalities of certain « doctor guru »….

All results are summarized in Table 1.

A Lot of Viruses Is a Little Virus


Knowing the absolute numbers of virions in an infection promotes better understanding of disease dynamics and response of the immune system. Here we use current knowledge on the concentrations of virions in infected individuals to estimate the total number and mass of SARS-CoV-2 virions in an infected person. Although each infected person carries an estimated 1 billion to 100 billion virions during peak infection, their total mass is no more than 0.1 mg. This curiously implies that all SARS-CoV-2 virions currently in all human hosts have a mass of between 100 g and 10 kg.