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References

Aktuell

Bundesregierung 2020

Bundesregierung, *Wie wir COVID-19 unter Kontrolle bekommen*. Online **2020**, Apr. 6, 1–17.

Die Vermeidung dieses Worst Case hat deswegen oberste strategische Priorität und ist nach den Berechnungen und Empfehlungen dieses Expertenteams nicht nur zwingend notwendig, sondern auch immer noch möglich.

Bundestag 2013

Deutscher Bundestag, *Bericht zur Risikoanalyse im Bevölkerungsschutz 2012*. Online **2013**, Jan. 3, 1–88.

Chia 2020

Po Ying Chia, Kristen Kelli Coleman, Yian Kim Tan & Sean Wei Xiang Ong et al., *Detection of Air and Surface Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Hospital Rooms of Infected Patients*. medRxiv **2020**, 20046557, 1–20. DOI:10.1101/2020.03.29.20046557.

medRxiv2020-a20046557-Supplement.docx

Background: Understanding the particle size distribution in the air and patterns of environmental contamination of SARS-CoV-2 is essential for infection prevention policies.

Objective: To detect the surface and air contamination by SARS-CoV-2 and study the associated patient-level factors.

Design: Cross-sectional study.

Setting: Airborne infection isolation rooms (AIIRs) at the National Centre for Infectious Diseases, Singapore.

Patients: COVID-19 inpatients with a positive PCR test for SARS-CoV-2 within 72 hours before the environmental sampling.

Measurements: Extent of environmental surface contamination in AIIRs of 30 COVID-19 patients by PCR on environmental swabs. The particle size distribution of SARS-CoV-2 in the air was measured using NIOSH air samplers.

Results: 245 surface samples were collected from 30 rooms of COVID-19 patients, and air sampling was conducted in 3 rooms. 56.7 % of the rooms had at least one environmental surface contaminated, with 18.5 % of the toilet seats and toilet flush button being contaminated. High touch surface contamination was shown in ten (66.7 %) out of 15 patients in the first week of illness, and three (20 %) beyond the first week of illness (p = 0.010). Air sampling of two COVID-19 patients (both day 5 of symptoms) detected SARS-CoV-2 PCRpositive particles of sizes >4 µm and 1-4 µm. In a single subject at day 9 of symptoms, no SARS-CoV-2 PCR-positive particles were detected.

Limitations: Viral culture results were not available to assess the viability of the virus contaminating the air and surface.

Conclusion: Environmental contamination was detected in rooms with COVID-19 patients in early stages of illness, but was significantly less after day 7 of disease.

Under AIIR conditions, SARS-CoV-2 respiratory particles can be detected at sizes 1-4 µm and >4 µm in diameter in the air which warrants further studies.

Po Ying Chia, MBBS1, ; Kristen Kelli Coleman, PhD4 ; Yian Kim Tan, PhD5 ; Sean Wei Xiang Ong1, , Marcus Gum, BSc5; Sok Kiang Lau, PhD5; Stephanie Sutjipto, MBBS1,; Pei Hua Lee, MBBS1,; Than The Son, DVM4; Barnaby Edward Young, M. B. Bchir1,; Donald K. Milton, MD, DrPH6; Gregory C. Gray, MD4,; Stephan Schuster, PhD9; Timothy Barkham, MBBS2,; Partha Prathim De, MBBS2,; Shawn Vasoo, MBBS1,; Monica Chan, BMBS1,; Brenda Sze Peng Ang, MBBS, MPH1,; Boon Huan Tan, PhD5; Yee-Sin Leo, MBBS, MPH1,; Oon-Tek Ng, MBBS, MPH1,; Michelle Su Yen Wong, PhD5; & Kalisvar Marimuthu, MBBS1

Ferretti 2020

Luca Ferretti et al., *Quantifying SARS-CoV-2 transmission suggests epidemic control with digital contact tracing.* science **2020**, abb6936. DOI:10.1126/science.abb6936.

s2020-abb6936-Supplement.pdf

The newly emergent human virus SARS-CoV-2 is resulting in high fatality rates and incapacitated health systems. Preventing further transmission is a priority. We analyzed key parameters of epidemic spread to estimate the contribution of different transmission routes and determine requirements for case isolation and contact-tracing needed to stop the epidemic. We conclude that viral spread is too fast to be contained by manual contact tracing, but could be controlled if this process was faster, more efficient and happened at scale. A contact-tracing App which builds a memory of proximity contacts and immediately notifies contacts of positive cases can achieve epidemic control if used by enough people. By targeting recommendations to only those at risk, epidemics could be contained without need for mass quarantines ('lock-downs') that are harmful to society. We discuss the ethical requirements for an intervention of this kind.

Keywords: Luca Ferretti1*, Chris Wymant1*, Michelle Kendall1, Lele Zhao1, Anel Nurtay1, Lucie Abeler-Dörner1, Michael Parker2, David Bonsall1'3!, Christophe Fräser1'4! |

Gewin 2020

Virginia Gewin, *Into the digital classroom, Five tips for moving teaching online as COVID-19 takes hold.* nature **580** (2020), 295–296.

Rolla has one crucial tip: seek constant feedback from students. "I am the director of this movie," he says, "but we are all in this together." He asks his students precise questions to demonstrate what they have just learnt and how each concept builds on their existing base of knowledge. He also asks for feedback to improve the course. When students asked for more concrete examples of complex, abstract theorems to make sure they understood the concepts, he obliged. "The biggest risk is that you become a talking head explaining things that students are not following," he says, "and they give up and just pretend."

Kraemer 2020

Moritz U. G. Kraemer et al., *The effect of human mobility and control measures on the COVID-19 epidemic in China.* science **2020**, abb4218. DOI:10.1126/science.abb4218.

s2020-abb4218-Supplement.pdf

The ongoing COVID-19 outbreak expanded rapidly throughout China. Major behavioral, clinical, and state o interventions have been undertaken to mitigate the epidemic and prevent the persistence of the virus in ? human populations in

China and worldwide. It remains unclear how these unprecedented interventions, ≈? including travel restrictions, affected COVID-19 spread in China. We use real-time mobility data from o Wuhan and detailed case data including travel history to elucidate the role of case importation on | transmission in cities across China and ascertain the impact of control measures. Early on, the spatial % distribution of COVID-19 cases in China was explained well by human mobility data. Following the ä implementation of control measures, this correlation dropped and growth rates became negative in most 8 locations, although shifts in the demographics of reported cases were still indicative of local chains of | transmission outside Wuhan. This study shows that the drastic control measures implemented in China ° substantially mitigated the spread of COVID-19.

Moritz U. G. Kraemer1'2'3*, Chia-HungYang4, Bernardo Gutierrez1'5, Chieh-Hsi Wu6, Brennan Klein*, David M. Pigott7, Open COVID-19 Data Working Groupt, Louis du Plessis1, Nuno R. Faria1, Ruoran Li8, William P. Hanage8, John S. Brownstein2'3, Maylis Layan9'10, Alessandro Vespignani*'11, Huaiyu Tian12, Christopher Dye1, Oliver G. Pyhus1'13*, Samuel V. Scarpino**

Leung 2020

Nancy H. L. Leung et al., *Respiratory virus shedding in exhaled breath and efficacy of face masks*. Nature Medicine (2020), preprint, 1–20. DOI:10.1038/s41591-020-0843-2.

NatMed2020.04-Leung-Supplement.pdf

We identified seasonal human coronaviruses, influenza viruses and rhinoviruses in exhaled breath and coughs of children and adults with acute respiratory illness. Surgical face masks significantly reduced detection of influenza virus RNA in respiratory droplets and coronavirus RNA in aerosols, with a trend toward reduced detection of coronavirus RNA in respiratory droplets. Our results indicate that surgical face masks could prevent transmission of human coronaviruses and influenza viruses from symptomatic individuals.

Nancy H. L. Leung 1, Daniel K. W. Chu1, Eunice Y. C. Shiu1, Kwok-Hung Chan2, James J. McDevitt3, Benien J. P. Hau1, Hui-Ling Yen 1, Yuguo Li5, Dennis K. M. Ip1, J. S. Malik Peiris1, Wing-Hong Seto1, Gabriel M. Leung1, Donald K. Milton7 & Benjamin J. Cowling

Mallapaty 2020

Smriti Mallapaty, *How sewage could reveal true scale of coronavirus outbreak*, *Wastewater testing could also be used as an early-warning sign if the virus returns*. nature **580** (2020), 176–177.

Mizumoto 2020

Kenji Mizumoto, Katsushi Kagaya, Alexander Zarebski & Gerardo Chowell, *Estimating the asymptomatic proportion of coronavirus disease 2019 (COVID-19) cases on board the Diamond Princess cruise ship, Yokohama, Japan, 2020*. Online **2020**, Mar. 12, 1–5. DOI:10.2807/1560-7917.

On 5 February 2020, in Yokohama, Japan, a cruise ship hosting 3,711 people underwent a 2-week quarantine after a former passenger was found with COVID-19 post-disembarking. As at 20 February, 634 persons on board tested positive for the causative virus. We conducted statistical modelling to derive the delay-adjusted asymptomatic proportion of infections, along with the infections' timeline. The estimated asymptomatic proportion was 17.9 % (95 % credible interval (CrI): 15.5–20.2 %). Most infections occurred before the quarantine start.

Tian 2020

Huaiyu Tian et al., *An investigation of transmission control measures during the first 50 days of the COVID-19 epidemic in China.* science **2020**, abb6105. DOI:10.1126/science.abb6105.

s2020-abb6105-Supplement.pdf

Responding to an outbreak of a novel coronavirus (agent of COVID-19) in December 2019, China banned travel to and from Wuhan city on 23 January and implemented a national emergency response. We investigated the spread and control of COVID-19 using a unique data set including case reports, human movement and public health interventions. The Wuhan shutdown was associated with the delayed arrival of COVID-19 in other cities by 2.91 days (95 %CI: 2.54-3.29). Cities that implemented control measures preemptively reported fewer cases, on average, in the first week of their outbreaks (13.0; 7.1-18.8) compared with cities that started control later (20.6; 14.5-26.8). Suspending intra-city public transport, closing entertainment venues and banning public gatherings were associated with reductions in case incidence. The national emergency response appears to have delayed the growth and limited the size of the COVID-19 epidemic in China, averting hundreds of thousands of cases by 19 February (day 50).

Huaiyu Tian, Yonghong Liu1*, Yidan Li1*, Chieh-Hsi Wu3*, Bin Chen**, Moritz U. G. Kraemer2'5'6, Bingying Li1, Jun Cai7, Bo Xu7, Qiqi Yang1, Ben Wang1, Peng Yang8, Yujun Cui9, Yimeng Song10, Pai Zheng11, Quaiiyi Wang8, Ottar N. Bjornstad12'13, Ruifli Yang8t, Bryan T. Grenfell14'15t, Oliver G. Pybus2t, Christopher Dye

Verma 2020

Mahendra K. Verma, Ali Asad & Soumyadeep Chatterjee, *COVID-19 epidemic, Power law spread and attening of the curve.* medRxiv **2020**, 20051680, 1–5. DOI:10.1101/2020.04.02.20051680.

In this letter we analyze the real-time infection data of COVID-19 epidemic for nine nations. We observe that till 27 March 2020, the number of infected individuals (I(t)) in USA, Spain, Germany, Iran, France, and India are growing exponentially. On the contrary, I(t) curves for China and South Korea exhibits power law behavior before attening of the curve. The derivative I.(t), which is also the daily infection count, is proportional to I(t) for the exponential regime, but not for the power law regime. These valuable indicators could be used for epidemic forecast. We also argue that long-term community transmission and/or the transmission by asymptomatic carriers traveling long distances may be inducing the power law growth of the epidemic.

Anthropologie

Herries 2020

Andy I. R. Herries et al., *Contemporaneity of Australopithecus, Paranthropus, and early Homo erectus in South Africa.* science **368** (2020), 47.

s368-0047-Supplement1.pdf, s368-0047-Supplement2.mp4

Understanding the extinction of Australopithecus and origins of Paranthropus and Homo in South Africa has been hampered by the perceived complex geological context of hominin fossils, poor chronological resolution, and a lack of well-preserved early Homo specimens. We describe, date, and contextualize the discovery of two hominin crania from Drimolen Main Quarry in South Africa. At

≈2.04 million to 1.95 million years old, DNH 152 represents the earliest definitive occurrence of Paranthropus robustus, and DNH 134 represents the earliest occurrence of a cranium with clear affinities to Homo erectus. These crania also show that Homo, Paranthropus, and Australopithecus were contemporaneous at ≈2 million years ago. This high taxonomic diversity is also reflected in non-hominin species and provides evidence of endemic evolution and dispersal during a period of climatic variability.

Andy I. R. Herries,2, Jesse M. Martin, A. B. Leece, Justin W. Adams, Giovanni Boschian, Renaud Joannes-Boyau, Tara R. Edwards, Tom Mallett, Jason Massey, Ashleigh Murszewski, Simon Neubauer, Robyn Pickering, David S. Strait, Brian J. Armstrong, Stephanie Baker, Matthew V. Caruana, Tim Denham, John Hellstrom, Jacopo Moggi-Cecchi, Simon Mokobane, Paul Penzo-Kajewski, Douglass S. Rovinsky, Gary T. Schwartz, Rhiannon C. Stammers, Coen Wilson, Jon Woodhead & Colin Menter

Welker 2020

Frido Welker, José María Bermúdez de Castro & Enrico Cappellini et al., *The dental proteome of Homo antecessor*. nature **580** (2020), 235–238.

n580-0235-Supplement.pdf

The phylogenetic relationships between hominins of the Early Pleistocene epoch in Eurasia, such as Homo antecessor, and hominins that appear later in the fossil record during the Middle Pleistocene epoch, such as Homo sapiens, are highly debated1–5. For the oldest remains, the molecular study of these relationships is hindered by the degradation of ancient DNA. However, recent research has demonstrated that the analysis of ancient proteins can address this challenge6–8. Here we present the dental enamel proteomes of H. antecessor from Atapuerca (Spain)9,10 and Homo erectus from Dmanisi (Georgia)1, two key fossil assemblages that have a central role in models of Pleistocene hominin morphology, dispersal and divergence. We provide evidence that H. antecessor is a close sister lineage to subsequent Middle and Late Pleistocene hominins, including modern humans, Neanderthals and Denisovans. This placement implies that the modern-like face of H. antecessor—that is, similar to that of modern humans—may have a considerably deep ancestry in the genus Homo, and that the cranial morphology of Neanderthals represents a derived form. By recovering AMELY-specific peptide sequences, we also conclude that the H. antecessor molar fragment from Atapuerca that we analysed belonged to a male individual. Finally, these H. antecessor and H. erectus fossils preserve evidence of enamel proteome phosphorylation and proteolytic digestion that occurred in vivo during tooth formation. Our results provide important insights into the evolutionary relationships between H. antecessor and other hominin groups, and pave the way for future studies using enamel proteomes to investigate hominin biology across the existence of the genus Homo.

Frido Welker1, ., Jazmín Ramos-Madrigal1, Petra Gutenbrunner2, Meaghan Mackie1, Shivani Tiwary2, Rosa Rakownikow Jersie-Christensen3, Cristina Chiva4, Marc R. Dickinson6, Martin Kuhlwilm7, Marc de Manuel7, Pere Gelabert7, María Martinón-Torres8, Ann Margvelashvili10, Juan Luis Arsuaga11, Eudald Carbonell13, Tomas Marques-Bonet4, Kirsty Penkman6, Eduard Sabidó4, Jürgen Cox2, Jesper V. Olsen3, David Lordkipanidze10, Fernando Racimo18, Carles Lalueza-Fox7, José María Bermúdez de Castro8, ., Eske Willerslev18 & Enrico Cappellini

Bibel

Machinist 2000

Peter Machinist, *The Man Moses*. Bible Review **16** (2000), ii, 18–19, 53.

Moses dies on Mt. Nebo—a strange and solitary death for a strangely solitary man. The biblical portrayal of Moses as distant and unapproachable, as the only biblical leader to see God "face to face" (Deuteronomy 34:10), presents Moses as representative of the Israelites—a people apart. At the same time, it encourages readers to concentrate more on the law he gave than on the life he lived.

Zevit 1990

Ziony Zevit, *Three Ways to Look at the Ten Plagues*. Bible Review **6** (1990), iii, 16–23, 42.

The Plague traditions, which were maintained orally by the Israelites until some time after the establishment of the monarchy, continued to be reworked in the land of Israel. There, far from the ecological context of Egypt, some phenomena natural in Egypt would have appeared incomprehensible to them and even fantastic, inviting imaginative embellishment.

The Israelite traditors, those who passed on the tradition, were no longer familiar with the Egyptian cultural milieu in which the disasters had been theoligized and made meaningful by their ancestors. These traditors, therefore, made them meaningful within their own world view by connection the plagues, which initiated the emergence of Israel as a covenant community, with the creation of the world.

Klima

Jiang 2020

Mingkai Jiang et al., *The fate of carbon in a mature forest under carbon dioxide enrichment*. nature **580** (2020), 227–231.

n580-0227-Supplement.pdf

Atmospheric carbon dioxide enrichment (eCO2) can enhance plant carbon uptake and growth1–5, thereby providing an important negative feedback to climate change by slowing the rate of increase of the atmospheric CO2 concentration6. Although evidence gathered from young aggrading forests has generally indicated a strong CO2 fertilization effect on biomass growth3–5, it is unclear whether mature forests respond to eCO2 in a similar way. In mature trees and forest stands7–10, photosynthetic uptake has been found to increase under eCO2 without any apparent accompanying growth response, leaving the fate of additional carbon fixed under eCO2 unclear4,5,7–11. Here using data from the first ecosystem-scale Free-Air CO2 Enrichment (FACE) experiment in a mature forest, we constructed a comprehensive ecosystem carbon budget to track the fate of carbon as the forest responded to four years of eCO2 exposure. We show that, although the eCO2 treatment of +150 parts per million (+38 per cent) above ambient levels induced a 12 per cent (+247 grams of carbon per square metre per year) increase in carbon uptake through gross primary production, this additional carbon uptake did not lead to increased carbon sequestration at the ecosystem level. Instead, the majority of the extra carbon was emitted back into the atmosphere via several respiratory fluxes, with increased soil respiration alone accounting for half of the total uptake surplus. Our results call into question the predominant thinking that the capacity of forests to act as carbon sinks will be generally enhanced under eCO2, and challenge the efficacy of climate mitigation strategies that rely on ubiquitous CO2 fertilization as a driver of increased carbon sinks in global forests.

Mingkai Jiang, Belinda E. Medlyn, John E. Drake, Remko A. Duursma, Ian C. Anderson, Craig V. M. Barton, Matthias M. Boer, Yolima Carrillo, Laura Castañeda-Gómez, Luke Collins, Kristine Y. Crous, Martin G. De Kauwe, Bruna M. dos Santos, Kathryn M. Emmerson, Sarah L. Facey, Andrew N. Gherlenda, Teresa E. Gimeno, Shun Hasegawa, Scott N. Johnson, Astrid Kännaste, Catriona A. Macdonald, Kashif Mahmud, Ben D. Moore, Loïc Nazaries, Elizabeth H. J. Neilson, Uffe N. Nielsen, Ülo Niinemets, Nam Jin Noh, Raúl Ochoa-Hueso, Varsha S. Pathare, Elise Pendall, Johanna Pihlblad, Juan Piñeiro, Jeff R. Powell, Sally A. Power, Peter B. Reich, Alexandre A. Renchon, Markus Riegler, Riikka Rinnan, Paul D. Rymer, Roberto L. Salomón, Brajesh K. Singh, Benjamin Smith, Mark G. Tjoelker, Jennifer K. M. Walker, Agnieszka Wujeska-Klause, Jinyan Yang, Sönke Zaehle & David S. Ellsworth

Luo 2020

Yiqi Luo & Shuli Niu, *The fertilization efect of CO_2 on a mature forest.* nature **580** (2020), 191–192.

Will mature forests absorb enough carbon from the atmosphere to mitigate climate change as levels of carbon dioxide increase? An experiment in a eucalyptus forest provides fresh evidence.

Kultur

Meller 2018

Harald Meller, *Das Wissen um Zeit und Raum*, *Himmelsdarstellungen in der Bronzezeit.* In: Matthias Wemhoff & Michael M. Rind (Hrsg.), *Bewegte Zeiten – Archäologie in Deutschland*, *Begleitband zur Ausstellung, 21. September 2018 – 9. Januar 2019, Gropius Bau, Berlin.* (Petersberg 2018), 351–351.

Über mehrere Jahrtausende treten so wiederkehrend astronomische Motive im sakralen Kontext auf. Die Bilder sind als fester Bestandteil der bronzezeitlichen Glaubensvorstellungen oder ritueller Handlungen zu sehen und wären ohne diese wohl nicht denkbar. Sie stehen für die kosmologische Vorstellung einer zyklischen Ordnung, in der Sonne und Mond als Gegenpole die zentralen Rollen einnehmen. Somit zeigt die Himmelsscheibe von Nebra als einziges Objekt nicht nur einen Zustand der Himmelsbeobachtung, sondern zugleich, wie sich der Wandel von einer bemerkenswert rationalen Denkweise hin zur rein mythologischen Vorstellung vollzog.

Metallzeiten

Meller 2019

Harald Meller, *Princes, Armies, Sanctuaries, The emergence of complex authority in the Central German Únětice culture.* Acta Archaeologica **90** (2019), i, 39–79.

The Circum-Harz group of the Central German Únetice Culture (2200-1600 BC) was a highly stratified society, which arose from the merging of the Corded Ware and Bell Beaker Cultures. This process was advanced by princes who established their legitimacy as rulers on symbolic references to both cultures as well as on newly created traditions and historical references. Their power was based on armed troops, which appear to have been accommodated in large houses or

longhouses. The hierarchical structure of the troops can be determined by both their distinctive weapons and the colours thereof. The prince of the Dieskau territory commanded the largest army and occupied a dominant position, expressed through the large Bornhöck burial mound and by the gold find of Dieskau, which itself most likely originated in the Bornhöck barrow. The article concludes with a discussion whether the Dieskau ruler was an actual head of a genuine state, according to the criteria put forth by Max Weber and Stefan Breuer. There is some indication that these criteria of statehood were fulfilled by the period associated with the Nebra Sky Disk at the latest, since this disk allowed the prince to act as 'a representative of the gods before the community' (Breuer 1998, 39).

Politik

VAN DER BLES 2020

Anne Marthe van der Bles, Sander van der Linden, Alexandra L. J. Freeman & David J. Spiegelhalter, *The effects of communicating uncertainty on public trust in facts and numbers*. PNAS **117** (2020), 7672–7683.

pnas117-07672-Supplement.pdf

Uncertainty is inherent to our knowledge about the state of the world yet often not communicated alongside scientific facts and numbers. In the "posttruth" era where facts are increasingly contested, a common assumption is that communicating uncertainty will reduce public trust. However, a lack of systematic research makes it difficult to evaluate such claims. We conducted five experiments —including one preregistered replication with a national sample and one field experiment on the BBC News website (total n = 5,780)—to examine whether communicating epistemic uncertainty about facts across different topics (e.g., global warming, immigration), formats (verbal vs. numeric), and magnitudes (high vs. low) influences public trust. Results show that whereas people do perceive greater uncertainty when it is communicated, we observed only a small decrease in trust in numbers and trustworthiness of the source, and mostly for verbal uncertainty communication. These Results could help reassure all communicators of facts and science that they can be more open and transparent about the limits of human knowledge.

Keywords: communication | uncertainty | trust | posttruth | contested

Significance: Does openly communicating uncertainty around facts and numbers necessarily undermine audiences' trust in the facts, or the communicators? Despite concerns among scientists, experts, and journalists, this has not been studied extensively. In four experiments and one field experiment on the BBC News website, words and numerical ranges were used to communicate uncertainty in news article-like texts. The texts included contested topics such as climate change and immigration statistics. While people's prior beliefs about topics influenced their trust in the facts, they did not influence how people responded to the uncertainty being communicated. Communicating uncertainty numerically only exerted a minor effect on trust. Knowing this should allow academics and science communicators to be more transparent about the limits of human knowledge.