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References

Afrika

Grillo 2020

Katherine M. Grillo et al., *Molecular and isotopic evidence for milk, meat, and plants in prehistoric eastern African herder food systems.* PNAS **117** (2020), 9793–9799.

pnas117-09793-Supplement.pdf

The development of pastoralism transformed human diets and societies in grasslands worldwide. The long-term success of cattle herding in Africa has been sustained by dynamic food systems, consumption of a broad range of primary and secondary livestock products, and the evolution of lactase persistence (LP), which allows digestion of lactose into adulthood and enables the milk-based, high-protein, low-calorie diets characteristic of contemporary pastoralists. Despite the presence of multiple alleles associated with LP in ancient and present-day eastern African populations, the contexts for selection for LP and the long-term development of pastoralist foodways in this region remain unclear. Pastoral Neolithic (c. 5000 to 1200 BP) faunas indicate that herders relied on cattle, sheep, and goats and some hunting, but direct information on milk consumption, plant use, and broader culinary patterns is rare. Combined chemical and isotopic analysis of ceramic sherds (n = 125) from Pastoral Neolithic archaeological contexts in Kenya and Tanzania, using compound-specific d13C and D13C values of the major fatty acids, provides chemical evidence for milk, meat, and plant processing by ancient herding societies in eastern Africa. These data provide the earliest direct evidence for milk product consumption and reveal a history of reliance on animal products and other nutrients, likely extracted through soups or stews, and plant foods. They document a 5,000-y temporal framework for eastern Africa pastoralist cuisines and cultural contexts for selection for alleles distinctive of LP in eastern Africa.

Keywords: archaeology | ceramics | lipid residue analysis | pastoralism | lactase persistence

Katherine M. Grillo, Julie Dunne, Fiona Marshall, Mary E. Prendergast, Emmanuelle Casanova, Agness O. Gidna, Anneke Janzen, Karega-Munene, Jennifer Keute, Audax Z. P. Mabulla, Peter Robertshaw, Toby Gillard, Caitlin Walton-Doyle, Helen L. Whelton, Kathleen Ryan & Richard P. Evershed

Significance: Lipid residue analysis of archaeological ceramics provides the earliest direct chemical evidence for milk, meat, and plant consumption by pastoralist societies in eastern Africa. Data for milk in specialized pastoral systems (c. 5000 to 1200 BP) reveal changing selective pressures for lactase persistence and provide support for models of gene–culture coevolution among pastoral populations.

Aktuell

Couzin-Frankel 2020

Jennifer Couzin-Frankel, *The mystery of the pandemic's 'happy hypoxia', Doctors debate how to treat patients with low blood oxygen but without trouble breathing.* science **368** (2020), 455–456. DOI:10.1126/science.368.6490.455.

What to do about it is prompting debate. An emerging view is that doctors should avoid aggressive treatment they've been trained to offer in other settings. Luciano Gattinoni, a guest professor in intensive care at the University of Göttingen Medical Center, is wary of what he calls a "Pavlovian response" to COVID-19 hypoxia, in which doctors may swoop in to inflate lungs with ventilators or high-pressure oxygen even when patients seem comfortable. Those measures, Gattinoni wrote online in JAMA on 24 April, could harm lungs that are inflating on their own but may be needed if patients aren't helped by noninvasive treatment.

Dowd 2020

Jennifer Beam Dowd et al., *Demographic science aids in understanding the spread and fatality rates of COVID-19*. PNAS **117** (2020), 9696–9698. DOI:10.1073/pnas.2004911117.

pnas117-09696-Supplement1.pdf, pnas117-09696-Supplement2.xlsx, pnas117-09696-Supplement3.gif

Governments around the world must rapidly mobilize and make difficult policy decisions to mitigate the coronavirus disease 2019 (COVID-19) pandemic. Because deaths have been concentrated at older ages, we highlight the important role of demography, particularly, how the age structure of a population may help explain differences in fatality rates across countries and how transmission unfolds. We examine the role of age structure in deaths thus far in Italy and South Korea and illustrate how the pandemic could unfold in populations with similar population sizes but different age structures, showing a dramatically higher burden of mortality in countries with older versus younger populations. This powerful interaction of demography and current age-specific mortality for COVID-19 suggests that social distancing and other policies to slow transmission should consider the age composition of local and national contexts as well as intergenerational interactions. We also call for countries to provide case and fatality data disaggregated by age and sex to improve real-time targeted forecasting of hospitalization and critical care needs.

Keywords: COVID-19 | demography | age structure | mortality

Jennifer Beam Dowd, Liliana Andriano, David M. Brazel, Valentina Rotondi, Per Block, Xuejie Ding, Yan Liu & Melinda C. Mills

Ferretti 2020

Luca Ferretti et al., *Quantifying SARS-CoV-2 transmission suggests epidemic control with digital contact tracing*. science **368** (2020), 619. DOI:10.1126/science.abb6936.

s368-0619-Supplement.pdf

The newly emergent human virus SARS-CoV-2 (severe acute respiratory syndrome–coronavirus 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. Although SARS-CoV-2 is spreading too fast to be contained by manual contact tracing, it could be controlled if this process were faster, more efficient, and happened at scale. A contact-tracing app that 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 resorting to mass quarantines ("lockdowns") that are harmful to society. We discuss the ethical requirements for an intervention of this kind.

Luca Ferretti, Chris Wymant, Michelle Kendall, Lele Zhao, Anel Nurtay, Lucie Abeler-Dörner, Michael Parker, David Bonsall & Christophe Fraser

Gibney 2020

Elizabeth Gibney, *Whose Coronavirus Strategy Worked Best? Scientists Hunt Most Effective Policies*. nature **581** (2020), 15–16.

Researchers sift through data to compare nations' vastly different containment measures.

Without a vaccine or effective treatment, stopping transmission remains the only defence against COVID-19. Knowing the effects of each control measure is crucial to figuring out which ones can be safely altered or removed, says Petherick. "I think that would be a huge contribution."

Hanlon 2020

Peter Hanlon et al., *COVID-19 – exploring the implications of long-term condition type and extent of multimorbidity on years of life lost, A modelling study*. Wellcome Open Research **2020**, Apr. 23, 1–15. DOI:10.12688/wellcomeopenres.15849.1.

Background: The COVID-19 pandemic is responsible for increasing deaths globally. Most estimates have focused on numbers of deaths, with little direct quantification of years of life lost (YLL) through COVID-19. As most people dying with COVID-19 are older with underlying long-term conditions (LTCs), some have speculated that YLL are low. We aim to estimate YLL attributable to COVID-19, before and after adjustment for number/type of LTCs.
Methods: We first estimated YLL from COVID-19 using standard WHO life tables, based on published age/sex data from COVID-19 deaths in Italy. We then used aggregate data on number/type of LTCs to model likely combinations of LTCs among people dying with COVID-19. From these, we used routine UK healthcare data to estimate life expectancy based on age/sex/different combinations of LTCs. We then calculated YLL based on age, sex and type of LTCs and multimorbidity count.
Results: Using the standard WHO life tables, YLL per COVID-19 death was 14 for men and 12 for women. After adjustment for number and type of LTCs, the mean YLL was slightly lower, but remained high (13 and 11 years for men and women, respectively). The number and type of LTCs led to wide variability in the estimated YLL at a given age (e.g. at $\geq$ 80 years, YLL was >10 years for people with 0 LTCs, and <3 years for people with $\geq$ 6).
Conclusions: Deaths from COVID-19 represent a substantial burden in terms of per-person YLL, more than a decade, even after adjusting for the typical number and type of LTCs found in people dying of COVID-19. The extent of multimorbidity heavily influences the estimated YLL at a given age. More comprehensive and standardised collection of data on LTCs is needed to better understand and quantify the global burden of COVID-19 and to guide policy-making and interventions.

Peter Hanlon, Fergus Chadwick, Anoop Shah, Rachael Wood, Jon Minton, Gerry McCartney, Colin Fischbacher, Frances S. Mair, Dirk Husmeier, Jason Matthiopoulos, David A. McAllister

Kraemer 2020

Moritz U. G. Kraemer et al., *The effect of human mobility and control measures on the COVID-19 epidemic in China*. science **368** (2020), 493–497. DOI:10.1126/science.abb4218.

s368-0493-Supplement.pdf

The ongoing coronavirus disease 2019 (COVID-19) outbreak expanded rapidly throughout China. Major behavioral, clinical, and state interventions were 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 used real-time mobility data from Wuhan and detailed case data including travel history to elucidate the role of case importation in transmission in cities across China and to ascertain the impact of control measures. Early on, the spatial distribution of COVID-19 cases in China was explained well by human mobility data. After the implementation of control measures, this correlation dropped and growth rates became negative in most locations, although shifts in the demographics of reported cases were still indicative of local chains of transmission outside of Wuhan. This study shows that the drastic control measures implemented in China substantially mitigated the spread of COVID-19.

Moritz U. G. Kraemer, Chia-Hung Yang, Bernardo Gutierrez, Chieh-Hsi Wu, Brennan Klein, David M. Pigott, Open COV- Data Working Group, Louis du Plessis, Nuno R. Faria, Ruoran Li, William P. Hanage, John S. Brownstein, Maylis Layan, Alessandro Vespignani, Huaiyu Tian, Christopher Dye, Oliver G. Pybus & Samuel V. Scarpino

Kupferschmidt 2020

Kai Kupferschmidt, *The Coronavirus Czar*. science **368** (2020), 462–465. DOI:10.1126/science.368.6490.462.

The COVID-19 pandemic has made German virologist Christian Drosten an unlikely cult figure.

Drosten is worried some German states are moving too fast, which could lead to an explosive resurgence of the virus. That concern has led him to depart from his science-only strategy. “In this situation, for once, I have to express my opinion a little bit here in this podcast,” he said on 22 April. Discussing press reports of shopping malls full of people, he said, “It’s sad to see that we may be in the process here in Germany of completely gambling away the advantage we have had.” With COVID-19 drugs and vaccines unavailable, such words may be the most powerful tool to curb the spread of the virus.

Li 2020

Ruiyun Li, Sen Pei2, Bin Chen, Yimeng Song, Tao Zhang, Wan Yang & Jeffrey Shaman, *Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV-2)*. science **368** (2020), 489–493. DOI:10.1126/science.abb3221.

s368-0489-Supplement.pdf

Estimation of the prevalence and contagiousness of undocumented novel coronavirus [severe acute respiratory syndrome–coronavirus 2 (SARS-CoV-2)] infections is critical for understanding the overall prevalence and pandemic potential of this disease. Here, we use observations of reported infection within China, in conjunction with mobility data, a networked dynamic metapopulation model, and Bayesian inference, to infer critical epidemiological characteristics associated with SARS-CoV-2, including the fraction of undocumented infections and their contagiousness. We estimate that 86 % of all infections were undocumented [95 % credible interval (CI): 82–90 %] before the 23 January 2020 travel restrictions. The transmission rate of undocumented infections per person was 55 % the transmission rate of documented infections (95 % CI: 46–62 %), yet, because of their greater numbers, undocumented infections were the source of 79 % of the documented

cases. These findings explain the rapid geographic spread of SARS-CoV-2 and indicate that containment of this virus will be particularly challenging.

MOORE 2020

John B. Moore & Carl H. June, *Cytokine release syndrome in severe COVID-19*. science **368** (2020), 473–474. DOI:10.1126/science.abb8925.

Lessons from arthritis and cell therapy in cancer patients point to therapy for severe disease.

VOGEL 2020

Gretchen Vogel & Jennifer Couzin-Frankel, *Children's role in pandemic is still a puzzle*. science **368** (2020), 562–563. DOI:10.1126/science.368.6491.562.

Some countries reopen schools, hoping it won't accelerate transmission.

Even without those efforts, daily case numbers could soon provide a reality check. If children are ample virus spreaders after all, cases could surge in a matter of weeks in the countries reopening their schools. If they aren't, parents and policymakers will heave a sigh of relief and more countries may follow. "Everyone is looking at each other," Van den Hof says, "to see what will happen."

WICHMANN 2020

Dominic Wichmann et al., *Autopsy Findings and Venous Thromboembolism in Patients With COVID-19: A Prospective Cohort Study*. Annals of Internal Medicine (2020), preprint, 1–22. DOI:10.7326/M20-2003.

Background: The new coronavirus, severe acute respiratory syndrome coronavirus-2 (SARS–CoV-2), has caused more than 210 000 deaths worldwide. However, little is known about the causes of death and the virus's pathologic features.

Objective: To validate and compare clinical ndings with data from medical autopsy, virtual autopsy, and virologic tests.

Setting: Autopsies performed at a single academic medical center, as mandated by the German federal state of Hamburg for patients dying with a polymerase chain reaction–conrmed diagnosis of COVID-19.

Patients: The first 12 consecutive COVID-19–positive deaths.

Measurements: Complete autopsy, including postmortem computed tomography and histopathologic and virologic analysis, was performed. Clinical data and medical course were evaluated.

Results: Median patient age was 73 years (range, 52 to 87 years), 75 % of patients were male, and death occurred in the hospital (n = 10) or outpatient sector (n = 2). Coronary heart disease and asthma or chronic obstructive pulmonary disease were the most common comorbid conditions (50 % and 25 %, respectively). Autopsy revealed deep venous thrombosis in 7 of 12 patients (58 %) in whom venous thromboembolism was not suspected before death; pulmonary embolism was the direct cause of death in 4 patients. Postmortem computed tomography revealed reticular inltration of the lungs with severe bilateral, dense consolidation, whereas histomorphologically diuse alveolar damage was seen in 8 patients. In all patients, SARS–CoV-2 RNA was detected in the lung at high concentrations; viremia in 6 of 10 and 5 of 12 patients demonstrated high viral RNA titers in the liver, kidney, or heart.

Limitation: Limited sample size.

Conclusion: The high incidence of thromboembolic events suggests an important role of COVID-19–induced coagulopathy. Further studies are needed to investigate the molecular mechanism and overall clinical incidence of COVID-19–related death, as well as possible therapeutic interventions to reduce it.

Dominic Wichmann, Jan-Peter Sperhake, Marc Lutgehetmann, Stefan Steurer, Carolin Edler, Axel Heinemann, Fabian Heinrich, Herbert Mushumba, Inga Kniep, Ann Sophie Schroder, Christoph Burdelski, Geraldine de Heer, Axel Nierhaus, Daniel Frings, Susanne Pfefferle, Heinrich Becker, Hanns Bredereke-Wiedling, Andreas de Weerth, Hans-Richard Paschen, Sara Sheikhzadeh-Eggers, Axel Stang, Stefan Schmiedel, Carsten Bokemeyer, Marylyn M. Addo, Martin Aepfelbacher, Klaus Puschel, Stefan Kluge

Bibel

Aland 1989

Kurt Aland & Siegfried Meurer (Hrsg.), *Wissenschaft und Kirche*, *Festschrift für Eduard Lohse*. Texte und Arbeiten zur Bibel 4 (Bielefeld 1989).

Niesiołowski-Spanò 2019

Łukasz Niesiołowski-Spanò, *The Abraham and Esau-Jacob Stories in the Context of the Maccabean Period*. In: Łukasz Niesiołowski-Spanò & Emanuel Pfoh (Hrsg.), *Biblical Narratives, Archaeology and Historicity*, *Essays in Honour of Thomas L. Thompson*. Library of Hebrew Bible/Old Testament studies 680 (London 2019), 49–61.

This is not the right place to discuss in depth the possible origins of the traditions about Abraham and Jacob-and-Esau. I am also not going to discuss the historical period of the earliest attestation of these biblical figures, which incidentally still remains a very complicated issue. The aim of this study is to look at these two stories from Genesis and investigate their possible role in the late second century BCE (cf. my earlier work, dealing with a similar topic, but from a different point of departure: Niesiolowski-Spanò 2006). Therefore, I am not going to discuss how old the stories are or the figures of the patriarchs and where they came from. I may, however, try to shed light on the possible historical context that might have influenced and inspired the current version of these stories and their place within the framework of Genesis.

Ussishkin 2014

David Ussishkin, *Biblical Lachish*, *A tale of construction, destruction, excavation and restoration*. (Jerusalem 2014).

Biblical Lachish was one of the most important cities in the Land of Israel for more than three thousand years. In the second millennium B.C.E. Lachish was a large Canaanite city-state, and during the period of the Judean kingdom, a mighty fortress city. Sennacherib, king of Assyria, conquered it in the course of a fierce battle in 701 B.C.E. That conquest was immortalized in a series of reliefs erected in Sennacherib's palace at Nineveh in Assyria.

The special importance of Lachish, the large scale of the excavations and the unique discoveries make it a key site for the study of the history and archaeology of the Biblical period. This book, published by the Israel Exploration Society and

the Biblical Archaeology Society, summarizes in clear and simple language for the general public the history of Lachish and its archaeological findings.

Three archaeological campaigns have been completed at Lachish. The first, from 1932 to 1938, was carried out by the British archaeologist James L. Starkey and came to an end when Starkey was murdered by Arab militants. The second, limited in scope and scale, was conducted by Yohanan Aharoni in 1966 and 1968. The third, from 1973 to 1994, was directed by this book's author, David Ussishkin, on behalf of Tel Aviv University.

Ussishkin 2018

David Ussishkin, *Megiddo – Armageddon, The story of the Canaanite and Israelite city*. (Jerusalem 2018).

Large-scale archaeological excavations have been conducted at Tel Megiddo over the course of the last one hundred and thirteen years. No other central mound of the biblical period in the Land of Israel has been so intensively excavated and investigated. As a result, Megiddo has come to symbolize biblical archaeology and remains a key site for understanding the archaeology and history of the biblical period. The present book summarizes the history of Megiddo and its archaeological findings in clear and simple language for the general public.

Klima

Gronenborn 2016

Detlef Gronenborn, *Climate Fluctuations, Human Migrations, and the Spread of Farming in Western Eurasia, Refining the Argument*. In: Peter F. Biehl & Olivier P. Nieuwenhuyse (Hrsg.), *Climate and cultural change in prehistoric Europe and the Near East*. IEMA proceedings 6 (Albany 2016).

It has been suggested that the expansion of farming in western Eurasia was paced by Holocene cooling phases. However, the immediate effects and the mechanisms could not be explained. Based on a fine-graded data set of the west-central European early Neolithic Linear pottery culture a refined model of the interaction between climate variability and both population growth as well as decline is presented. The changing interrelation between these fluctuations may more thoroughly explain the step-wise advance of farming in western Eurasia.

Osborne 2008

Anne H. Osborne, Derek Vance, Eelco J. Rohling, Nick Barton, Mike Rogerson & Nuri Fello, *A humid corridor across the Sahara for the migration of early modern humans out of Africa 120,000 years ago*. PNAS **105** (2008), 16444–16447.

It is widely accepted that modern humans originated in subSaharan Africa ≈150–200 thousand years ago (ka), but their route of dispersal across the currently hyperarid Sahara remains controversial. Given that the first modern humans north of the Sahara are found in the Levant ≈120–90 ka, northward dispersal likely occurred during a humid episode in the Sahara within Marine Isotope Stage (MIS) 5e (130–117 ka). The obvious dispersal route, the Nile, may be ruled out by notable differences between archaeological finds in the Nile Valley and the Levant at the critical time. Further west, space-born radar images reveal networks of—now buried—fossil river channels that extend across the desert to the Mediterranean

coast, which represent alternative dispersal corridors. These corridors would explain scattered findings at desert oases of Middle Stone Age Aterian lithic industries with bifacial and tanged points that can be linked with industries further to the east and as far north as the Mediterranean coast. Here we present geochemical data that demonstrate that water in these fossil systems derived from the south during wet episodes in general, and penetrated all of the way to the Mediterranean during MIS 5e in particular. This proves the existence of an uninterrupted freshwater corridor across a currently hyperarid region of the Sahara at a key time for early modern human migrations to the north and out of Africa.

Middle Stone Age | Eemian | neodymium | paleochannel | sapropel

Pennisi 2020

Elizabeth Pennisi, *Carbon dioxide increase may promote 'insect apocalypse', Study links low-nutrient plants to fewer grasshoppers.* science **368** (2020), 459.

Sebastian Seibold, a conservation biologist at the Technical University of Munich who has been studying insect declines for the past 10 years, cautions that the idea needs to be tested in different ecosystems. "We cannot derive general conclusions from it," he says. "In German landscapes, there is no evidence for nutrient shortage," adds Wolfgang Wägele, a taxonomist at the Zoological Research Museum Alexander Koenig.

Reinhold 2020

Timo Reinhold et al., *The Sun is less active than other solar-like stars.* science **368** (2020), 518–521.

s368-0518-Supplement.pdf

The magnetic activity of the Sun and other stars causes their brightness to vary. We investigated how typical the Sun's variability is compared with other solar-like stars, i.e., those with near-solar effective temperatures and rotation periods. By combining 4 years of photometric observations from the Kepler space telescope with astrometric data from the Gaia spacecraft, we were able to measure photometric variabilities of 369 solar-like stars. Most of those with well-determined rotation periods showed higher variability than the Sun and are therefore considerably more active. These stars appear nearly identical to the Sun except for their higher variability. Therefore, we speculate that the Sun could potentially also go through epochs of such high variability.

Timo Reinhold, Alexander I. Shapiro, Sami K. Solanki, Benjamin T. Montet, Natalie A. Krivova, Robert H. Cameron & Eliana M. Amazo-Gómez

Santos 2020

Ângela R. G. Santos & Savita Mathur, *What future awaits the Sun?* science **368** (2020), 466–467.

Stellar data question the notion that the Sun is stemming its magnetic activity cycle.

Because stars rotate, dark spots move in and out of view and modulate the observed st ellar light (see the figure). Whereas the periodicity of the stellar light modulation is related to surface rotation, the amplitude is related to the percentage of stellar surface covered by spots, thus representing a proxy for stellar magnetic activity.

Kultur

Sutton 2020

John Sutton, *Personal Memory, the Scaffolded Mind, and Cognitive Change in the Neolithic*. (unpublished 2020), 209–229.

Kupfer

Johnson 2017

Michael A. Johnson, Fikri Kulakoğlu, K. Aslıhan Yener, Gonca Dardeniz & Evren Yazgan, *Experimental Smelting of Tin from Senir Sırtı and Hısarcık near Kayseri, Mostly Heartbreak, Some Elation*. In: Fikri Kulakoğlu & Gojko Barjamovic (Hrsg.), *Movement, Resources, Interaction*, *Proceedings of the 2nd Kültepe International Meeting Kültepe, 26–30 July 2015*. Subartu 39 (Turnhout 2017), 117–129.

At the very least, the aforementioned results put us in a very strong position to continue our experimental work with the promise of more concrete results. From a broader perspective, our current Results provide potentially key evidence for discussions of the earliest developments in bronze technology in Anatolia, placing the impetus for innovation locally and contradicting explanations that put the Anatolian sphere on the level of passive recipient.

Story or Book

Schug 2020

Joanna Schug, *The other public health crisis*. science **368** (2020), 480.

Social connection is critical, but many struggle to form and maintain meaningful relationships.

Together: The Healing Power of Human Connection in a Sometimes Lonely World. Vivek H. Murthy. Harper Wave, 2020. 352 pp.

Many of our social interactions now take place through screens rather than in person, and increasingly individualistic cultures cause us to put less priority on our relationships.

Collectivistic communities—those that emphasize the needs of the group over the needs of individuals—can foster connectedness by providing social institutions that bind people together. But oppressive social norms inherent in many such communities can cause undue stress, and those who do not conform to these norms can be ostracized and left even more isolated than those from individualistic communities.