

# Measles origin finding could inform COVID-19 research

June 18 2020

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Specimens in the basement of the Berlin Museum of Medical History at the Charité. Credit: Navena Widulin/Berlin Museum of Medical History at the Charité

An international group of researchers has tackled the controversial question of when measles first emerged, finding it could be linked to the rise of large cities. The team sequenced the genome of a measles strain from 1912 and looked backwards to assess when the virus likely arose in human populations, dating this at around 6th century BCE.

Alongside the findings published in *Science*, Australian evolutionary experts from the University of Sydney and University of Melbourne have published a complementary Perspective, proposing that similarly refining research about when COVID-19 and other [zoonotic diseases](#) emerged will assist in understanding how such pathogens jump from animals to humans.

University of Sydney Professor Simon Ho, corresponding author of the *Science* commentary, said the research could help efforts to pinpoint the time of emergence of measles in humans.

"Obtaining genomic data from RNA viruses such as the measles virus, which degrade rapidly in the environment, continues to be extremely challenging," said Professor Ho from the School of Life and Environmental Sciences.

"The sequencing of this measles genome by Ariane Düx, Sébastien Calvignac-Spencer and their colleagues is a profound achievement.

Abteilung:	Name:		Laufende
Heubner.	Stand:	<i>Bismarck</i>	No. <i>05</i>
Hinter Inf.	Alter:	<i>2 1/4 Jahr</i>	
Obduzent:	Rec. No.:	<i>1644</i>	
<i>Dr. Martin</i>	Aufnahmetag:	<i>30. / 5.</i>	
	Gestorben:	<i>3. / 6.</i>	
	Seziert:	<i>4. / "</i>	

*Leipzig, Masch. Cur. 8. 6. 12*  
*16. 12*  
*1912*

*6 Uhr*  
*11 Uhr*

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Klinische Diagnose und Notizen: *Masern, Bronchitis, Bronchiolitis, Bronchopneumonie.*

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Diagnose: *Bronchopneumonie an beiden Lungen, Bronchitis, Tracheitis, Bronchiektasen bei linken Lunge, Mandelabszess, Pharyngitis, multiple Abszesse. Schwellung der subkutanen Drüsen und einzelner Knoten im Fleck, alveolares Emphysem.*  
*Wichtig: Bronchopneumonie Herde, auch geringe interstitielle Entzündung.*

Autopsy report for 1912 measles case archived by the Berlin Museum of Medical History. Credit: Navena Widulin/Berlin Museum of Medical History at the Charité

"It's very difficult to pinpoint exactly when and where pathogens such as viruses and bacteria jump into humans. Sometimes these jumps happen and they fizzle out. But sometimes they take hold and spread across the globe.

"For any particular pathogen, the timing of the jump must have occurred between two time points: when it split from its nearest known relative

and when we look at the pathogen in humans and trace the lineages back to the [common ancestor](#)."

Professor Ho said although the human COVID-19 SARS-CoV-2 virus split from its closest known relative—another coronavirus from a [horseshoe bat](#)—about 30 to 40 years ago, the jump to humans most likely happened more recently.



Formalin-fixed lung of 1912 measles patient. Credit: Navena Widulin/Berlin Museum of Medical History at the Charité

"Had the coronavirus jumped from its animal host to a human much earlier than November or December last year, it probably would have been detected," he said.

Professor Ho, who runs the Molecular Ecology, Evolution and Phylogenetics lab in the Faculty of Science, said just as tracing the emergence of measles strongly suggests it was associated with the rise of large cities thousands of years ago, it is important to also understand more about COVID-19 to protect against and fight the pandemic.

"The chance of a [virus](#) jumping between species will generally increase with the amount of contact," said Professor Ho, referring to the fact that as a species, human civilisation is increasingly encroaching into the habitat of wild animals.

"We can see this process happening in zoos, where viruses can jump between species that would not normally be found together in the wild.

He said: "More work needs to be done to understand the diversity of viruses and their distribution in wildlife."

**More information:** A. Dux et al., "Measles virus and rinderpest virus divergence dated to the sixth century BCE," *Science* (2020).  
[science.sciencemag.org/cgi/doi ... 1126/science.aba9411](https://science.sciencemag.org/cgi/doi/10.1126/science.aba9411)

S.Y.W. Ho at University of Sydney in Sydney, NSW, Australia et al., "Dating the emergence of human pathogens," *Science* (2020).  
[science.sciencemag.org/cgi/doi ... 1126/science.abc5746](https://science.sciencemag.org/cgi/doi/10.1126/science.abc5746)

Provided by University of Sydney

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