

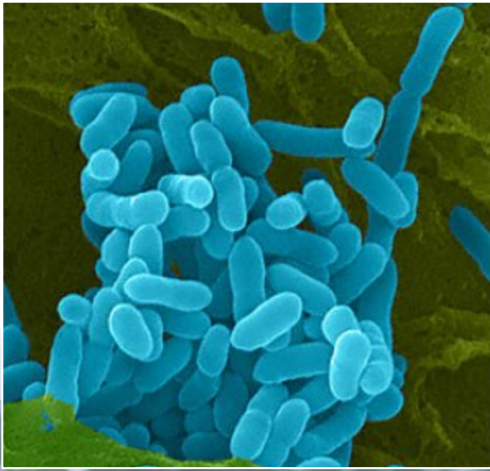
Evolution of *Burkholderia pseudomallei* and its disease dynamics

A global, regional, and local pictures



Claire Chewapreecha
JTTMM 6th December 2017





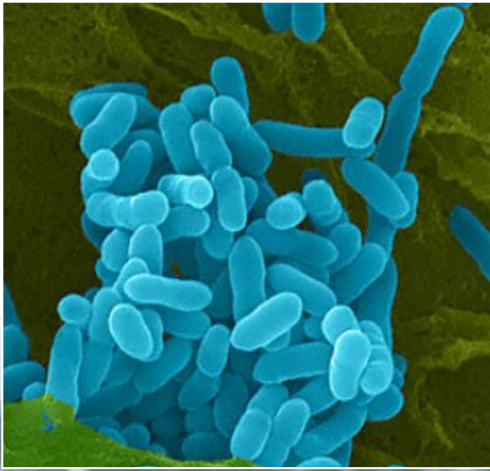
***Burkholderia pseudomallei* lives in soil and contaminated water**

Routes of infection

Inoculation
Inhalation
ingestion



Human melioidosis



Patients usually carry at least one predisposing factors

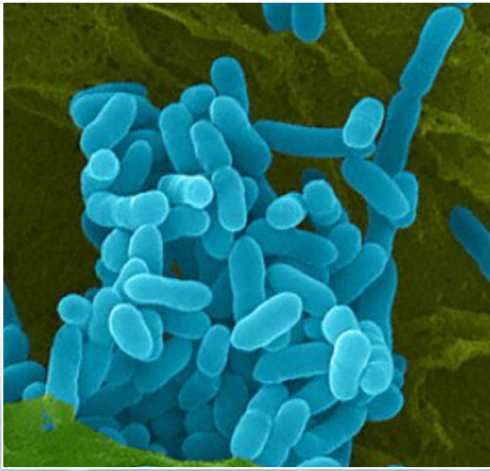
Healthy individuals

Diabetics (Risk ratio 39%)
Excessive alcohol usage (39%)
Chronic lung disease (26%)
Chronic renal disease (12%)



No human-human transmission

Currie et al. PLoS Negl. Trop. Dis. 2010



A lot of questions to be explored.

Healthy individuals

Diabetics (Risk ratio 39%)
Excessive alcohol usage (39%)
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Chronic renal disease (12%)



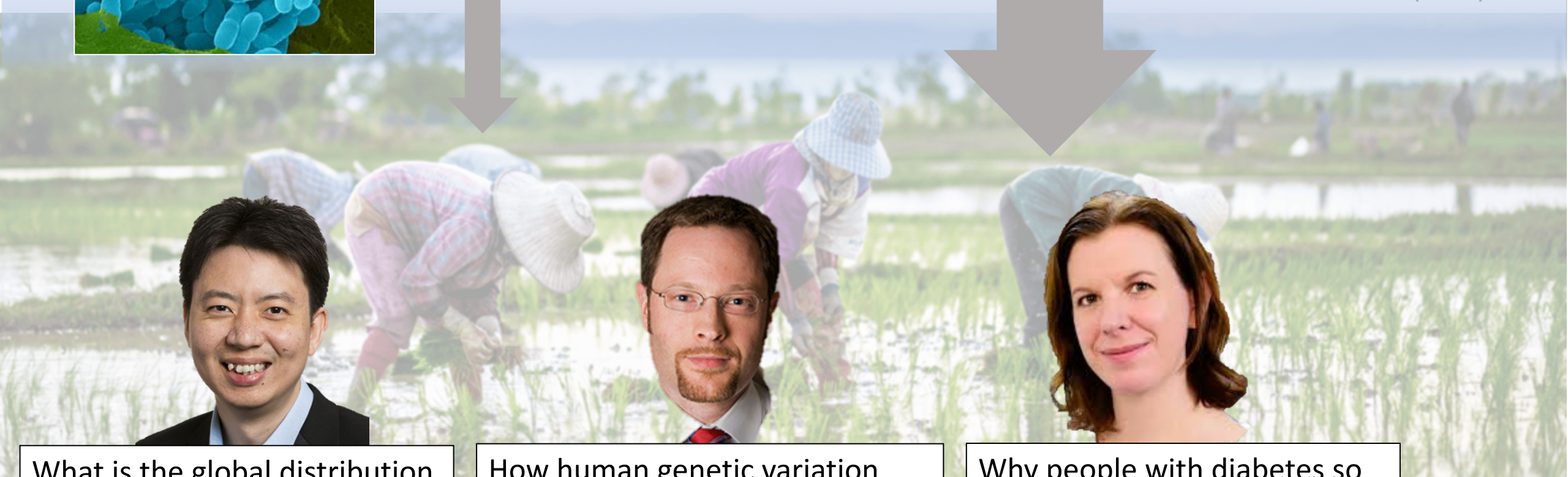
What is the global distribution of *B. pseudomallei*?



How human genetic variation leads to different host response?

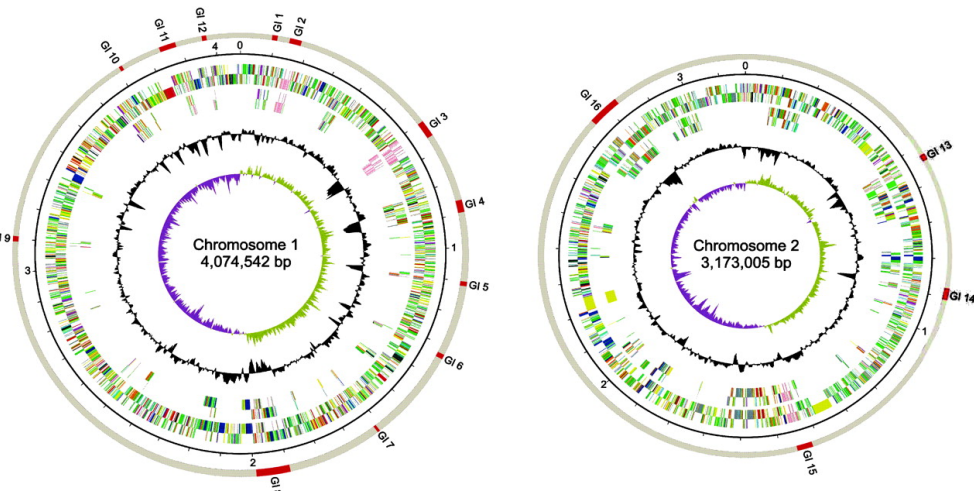


Why people with diabetes so susceptible to melioidosis?

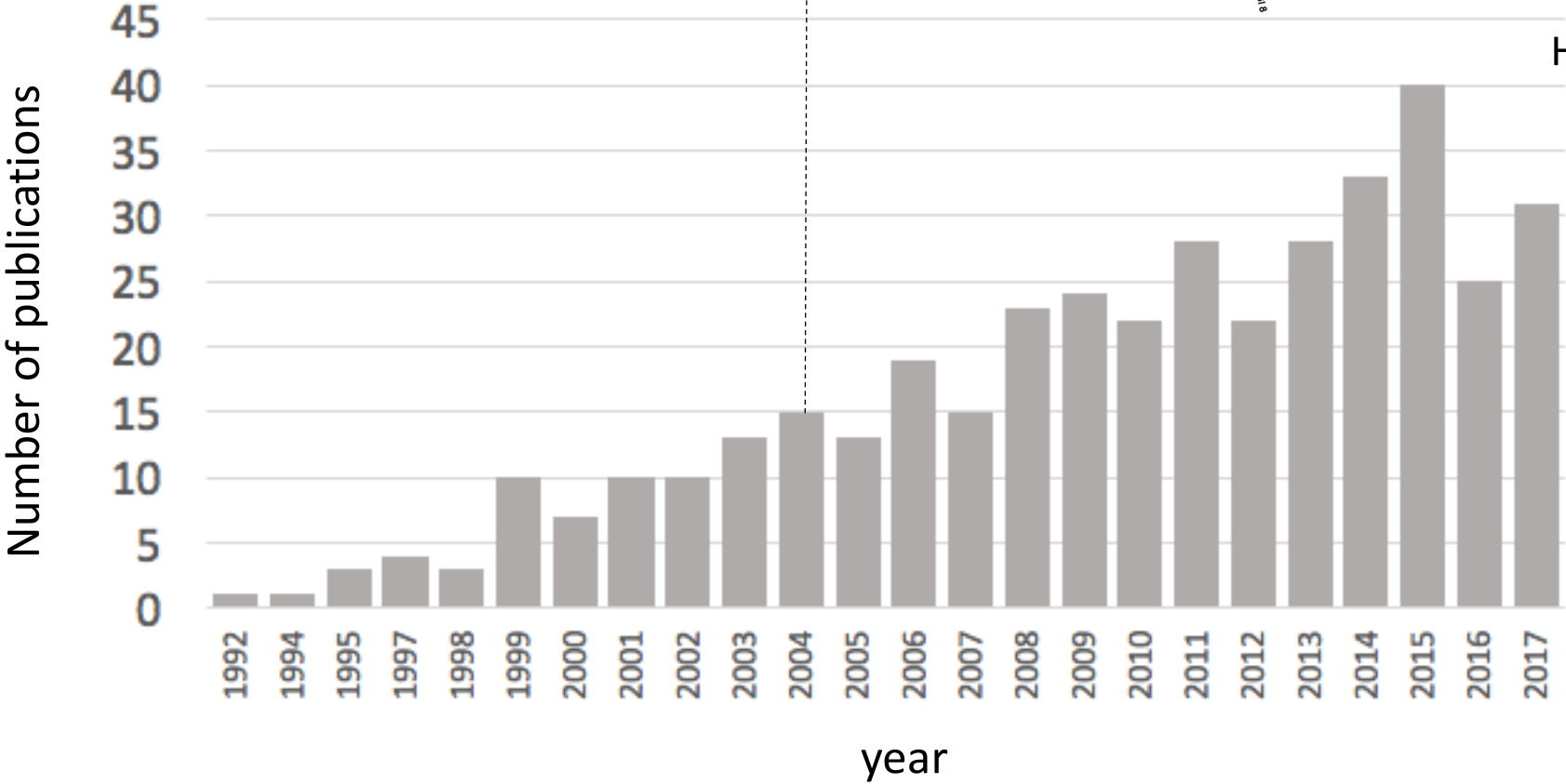


Genomic studies

Pubmed search: *B. pseudomallei* + genome

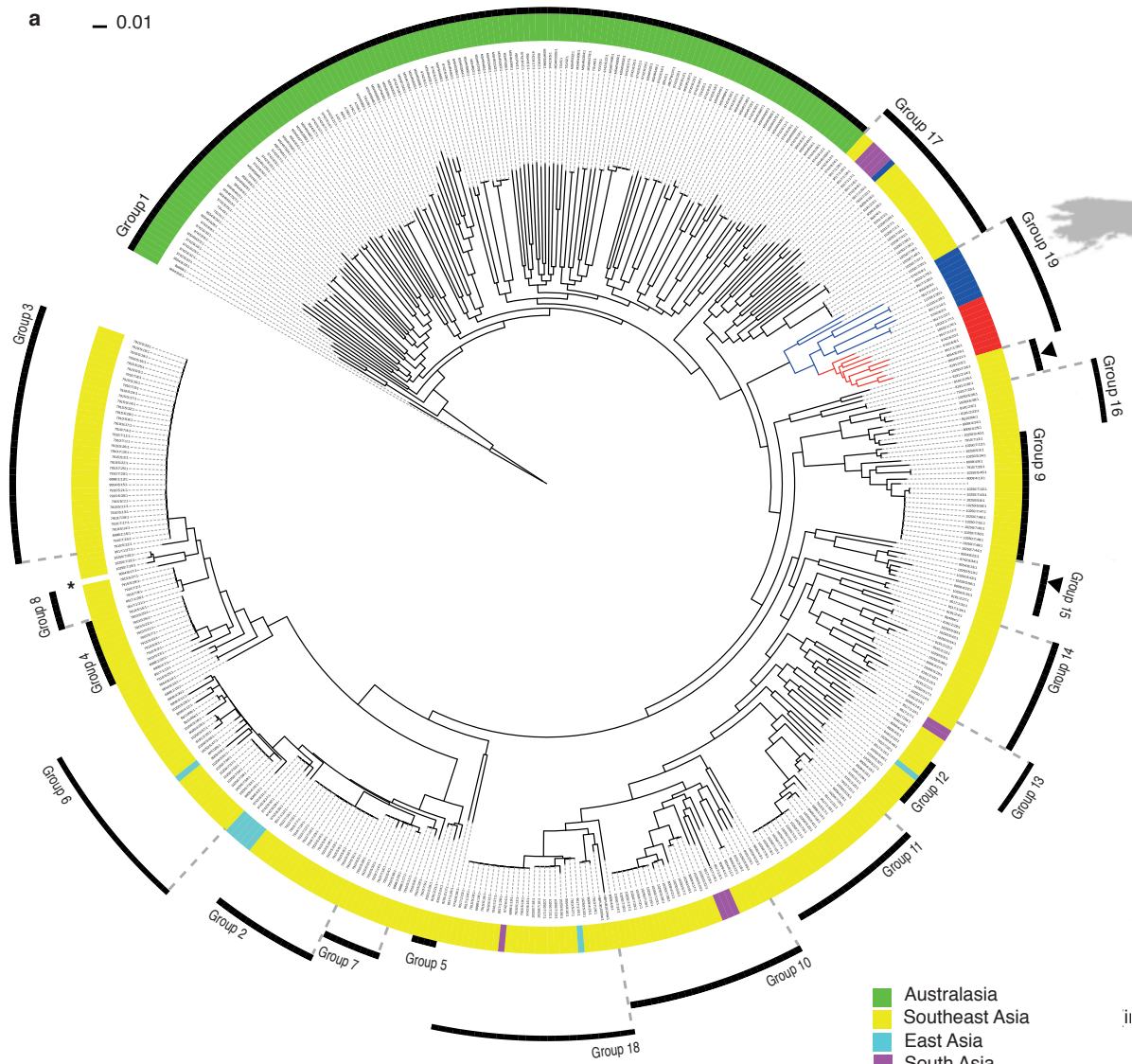


Holden *et al.* PNAS 2004



A global dissemination

a — 0.01

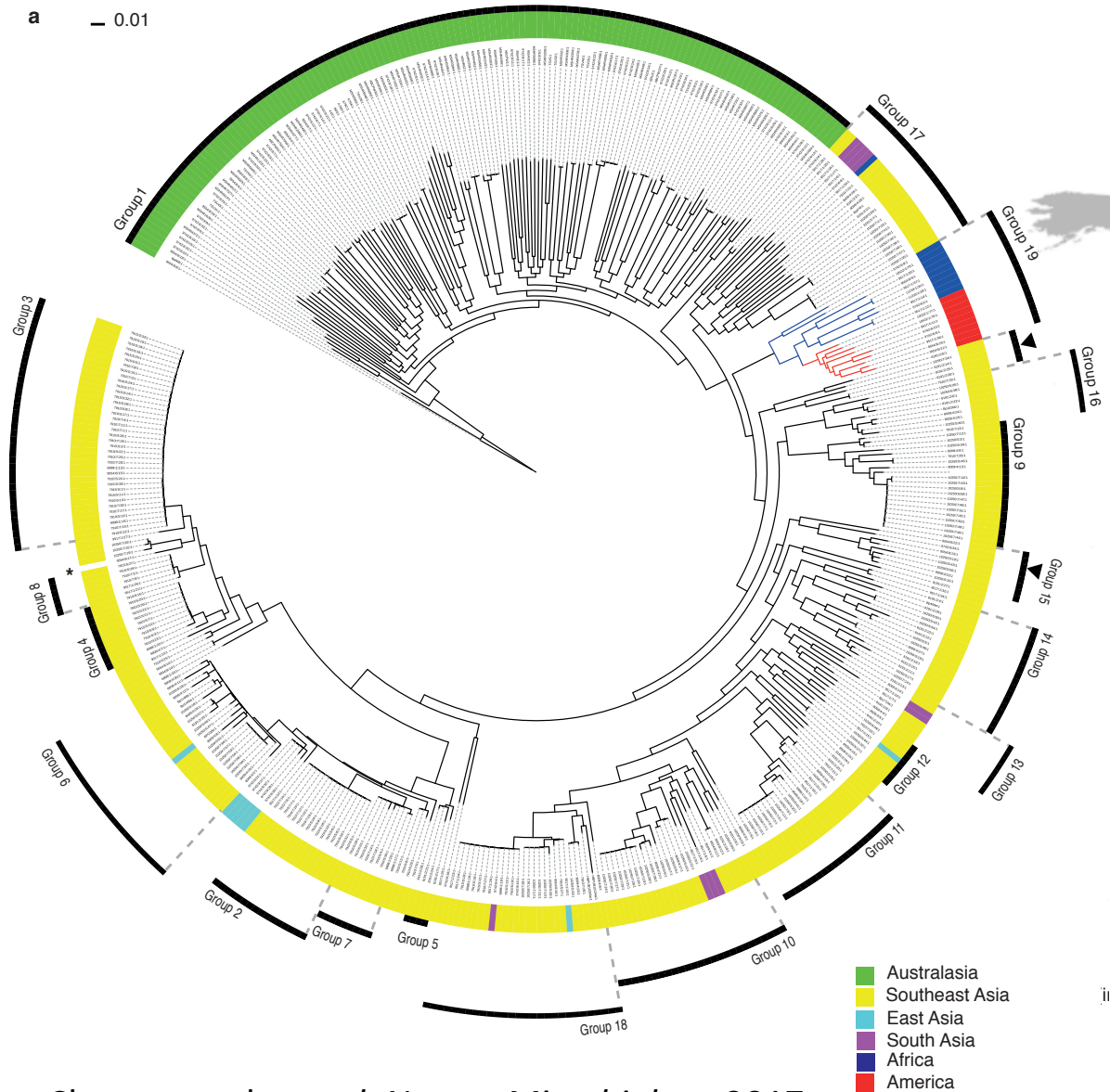


- Australasia
- Southeast Asia
- East Asia
- South Asia
- Africa
- America

ii

A global dissemination

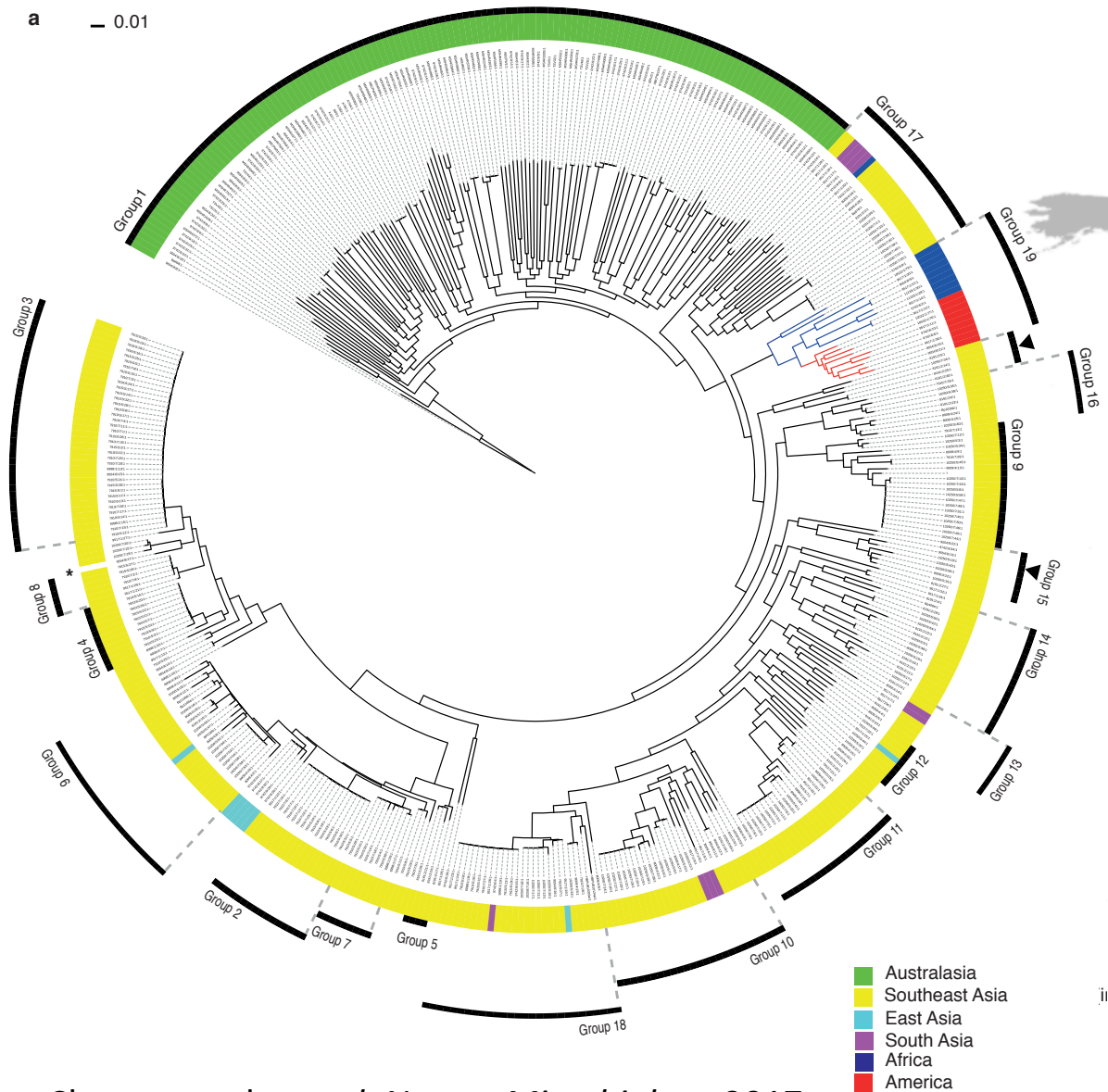
a — 0.01



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A global dissemination

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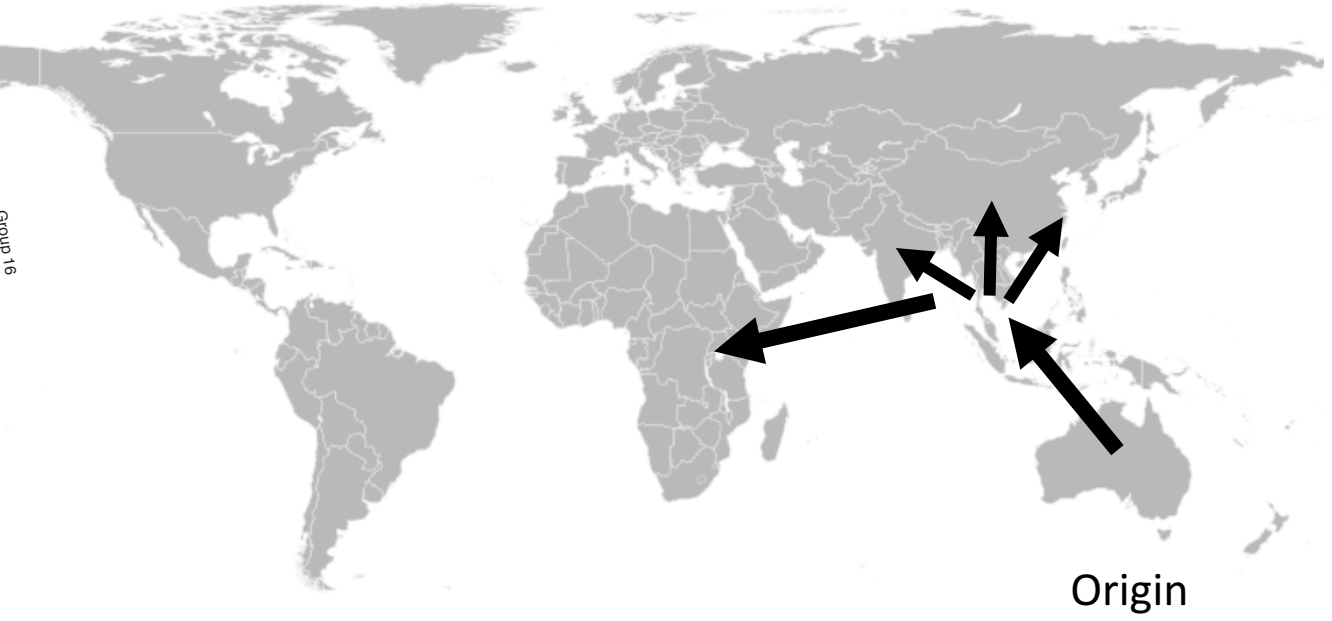
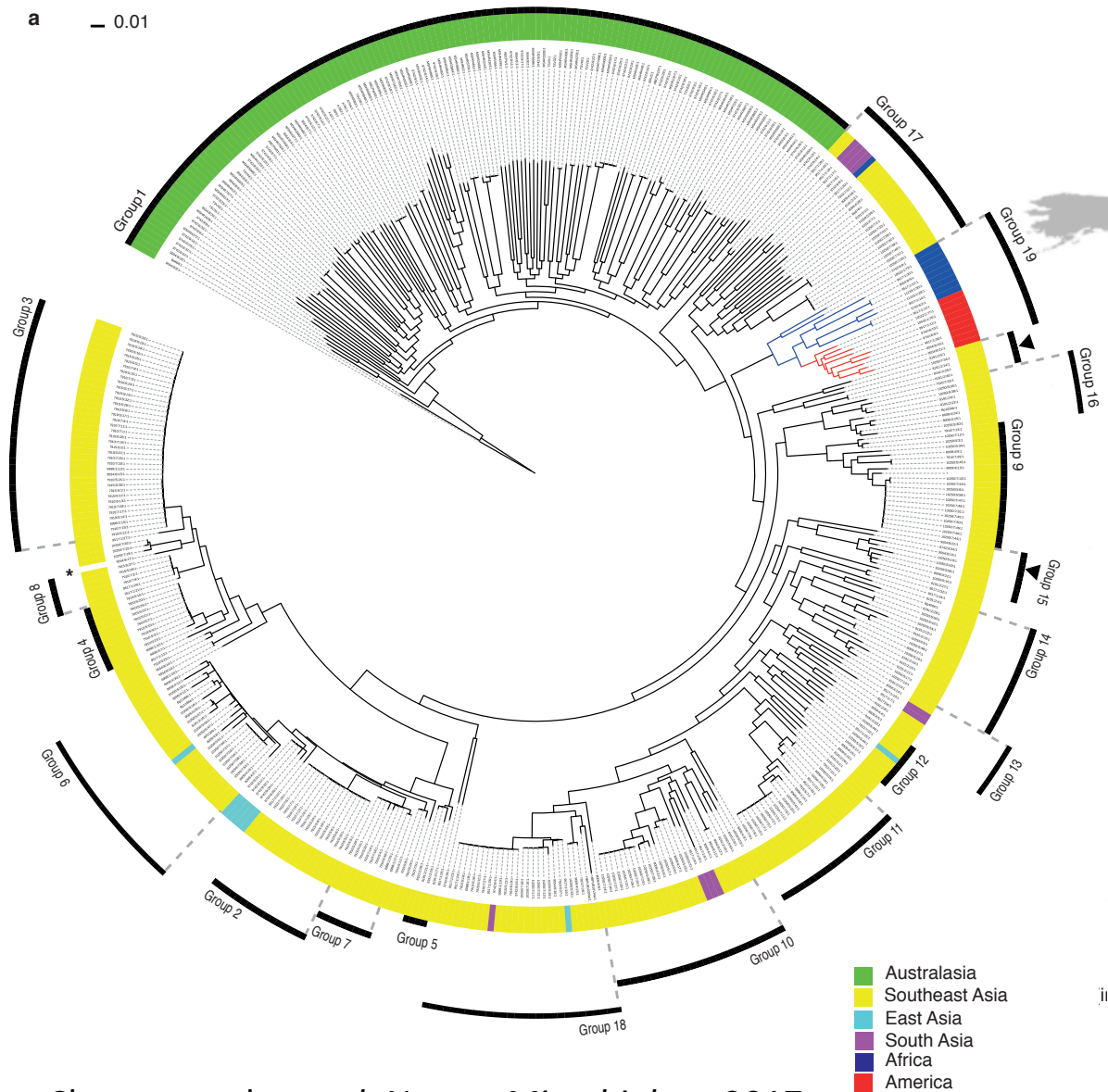


Origin

- Australasia
- Southeast Asia
- East Asia
- South Asia
- Africa
- America

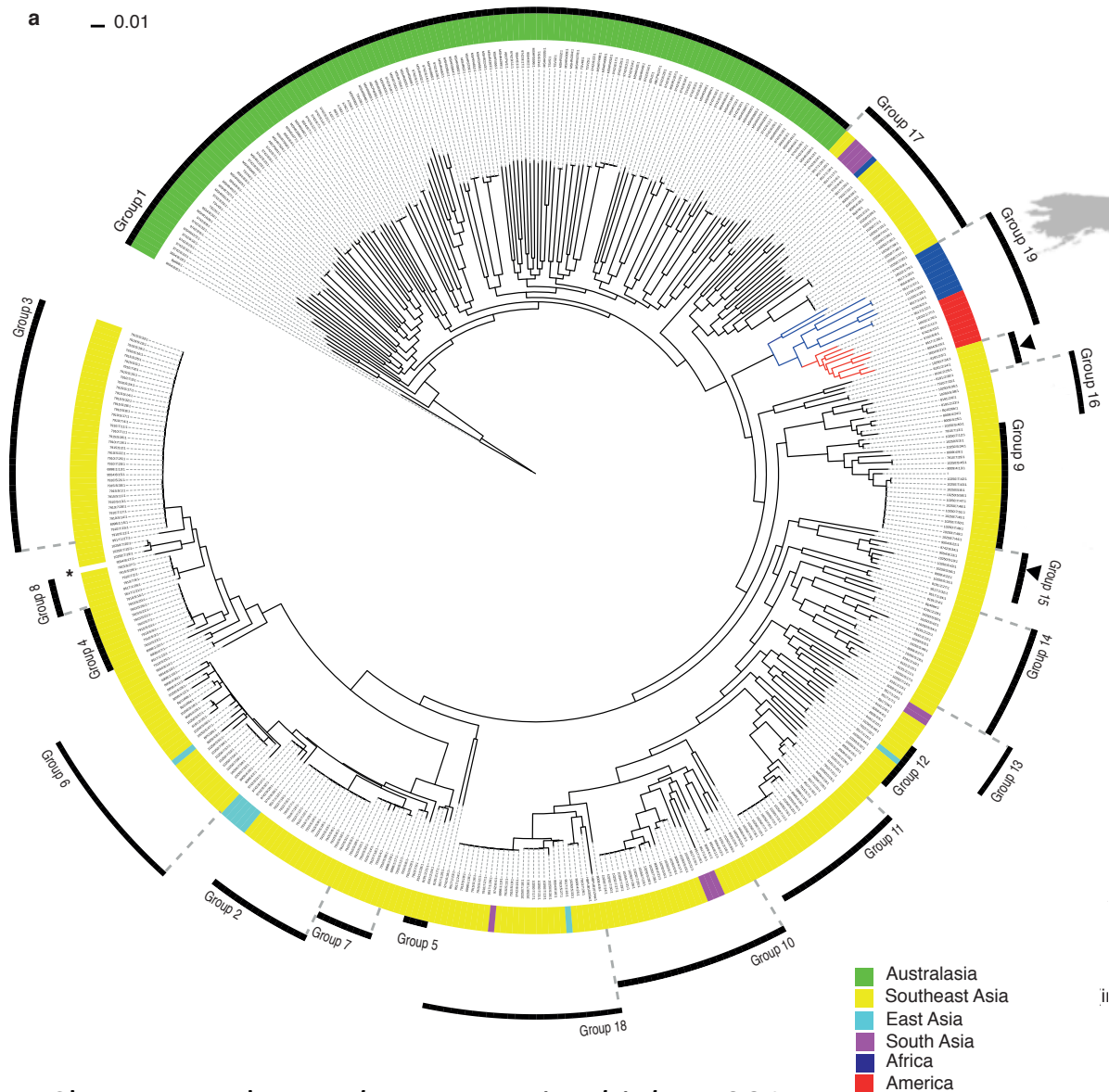
A global dissemination

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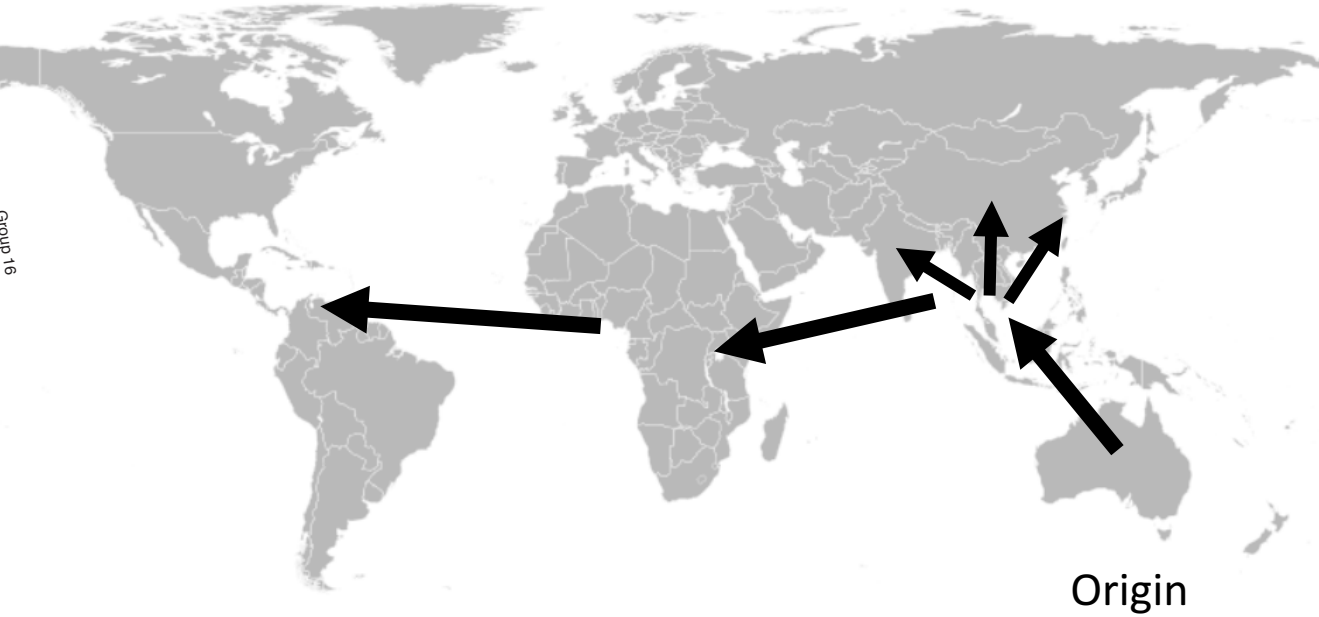


A global dissemination

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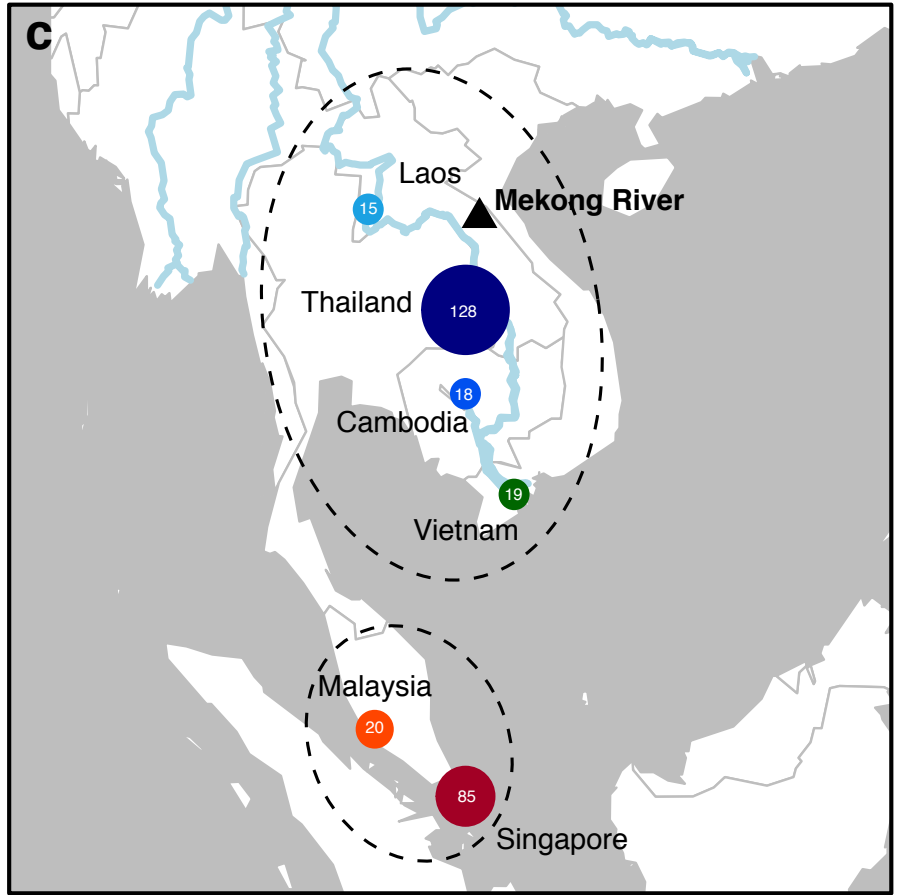
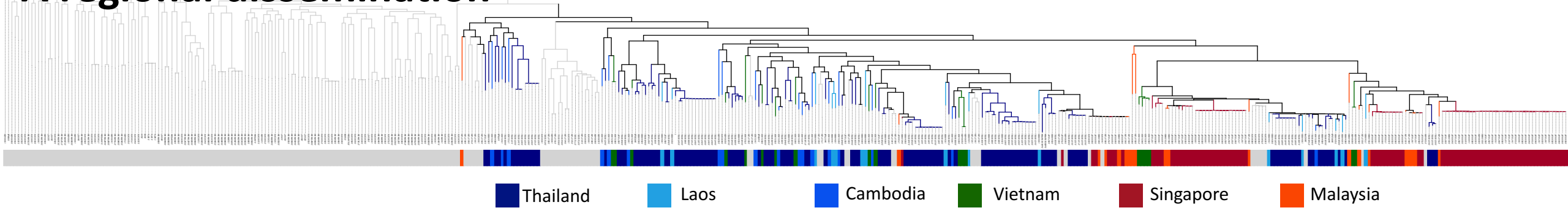


Chewapreecha *et al.* *Nature Microbiology* 2017



The most recent common ancestor of *B. pseudomallei* in America emerged around 17th – 18th century.

A regional dissemination



A regional dissemination

