



Towards more consistent estimates of Aboriginal de-population in the early colonial Australia

by Jack Carmody and Boyd Hunter

**Presented to Asia-Pacific Economic & Business History
conference in Hamilton (University of Waikato) 13-15
February 2014**

Extant estimates of pre-colonial Aboriginal population

- Radcliffe-Brown (1930): 300+k; Butlin (1983, 1993): 1-1.5m & Mulvaney (2002) consensus: 750-800k
- Need more transparent calculations to ensure estimates replicable & plausible: unpacking some problematic assumptions.

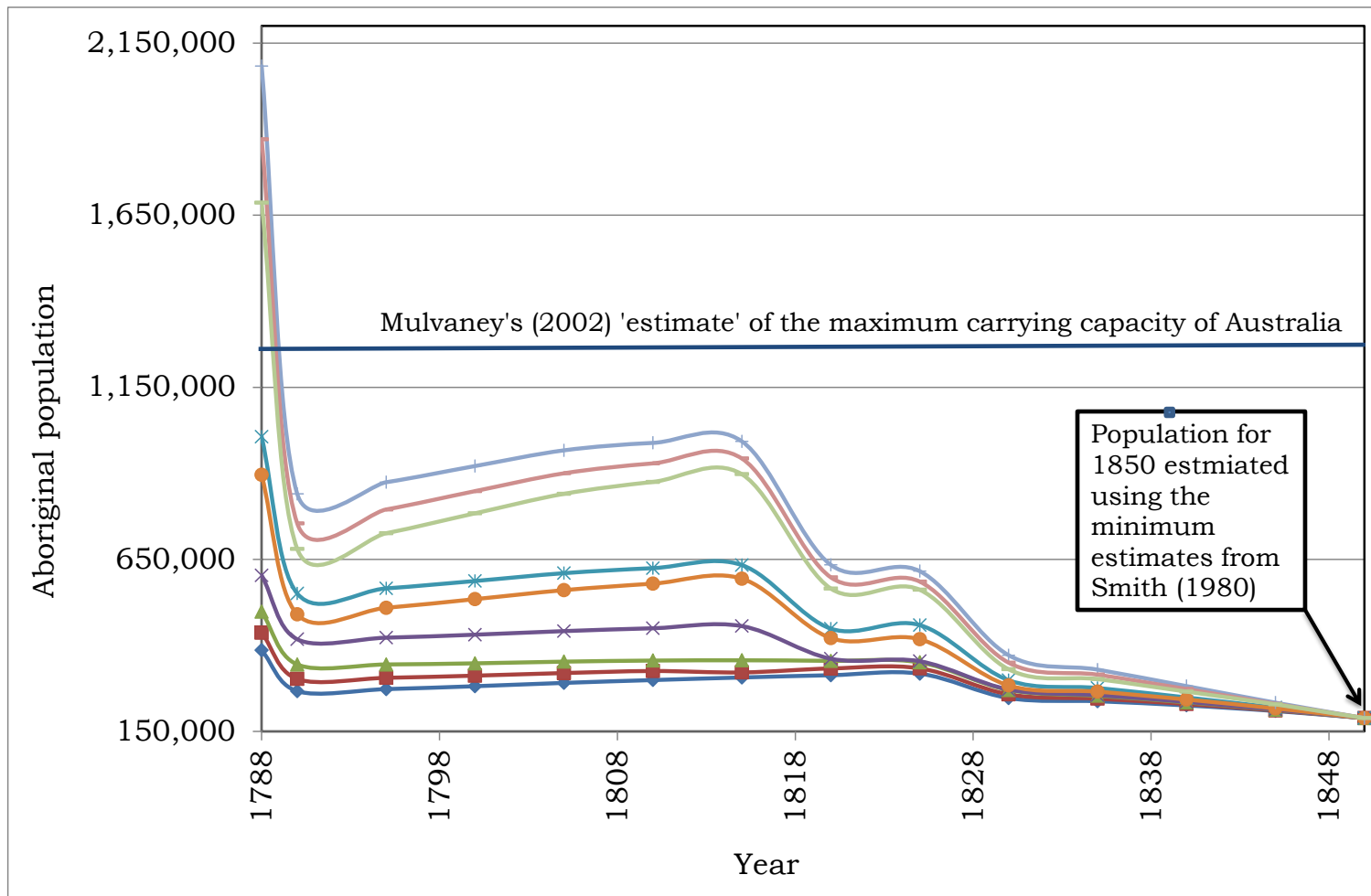
Invisible invaders from ‘other worlds’

- Macassans, Aborigines & small pox: Campbell (2002)
- Chicken pox versus small pox (Carmody)
- The role of other diseases: Interactions between diseases?

Alternative estimates of pre-contact Aboriginal population?

- Small pox transmitted from the NT circa 1780; & either small pox or chicken pox transmitted from Sydney 1789 (via expansion of settlement)
- Adding in ‘resource loss’ etc. for final population estimates

Revisiting the range of Butlin's estimates of the 1788 population (Hunter 2014)

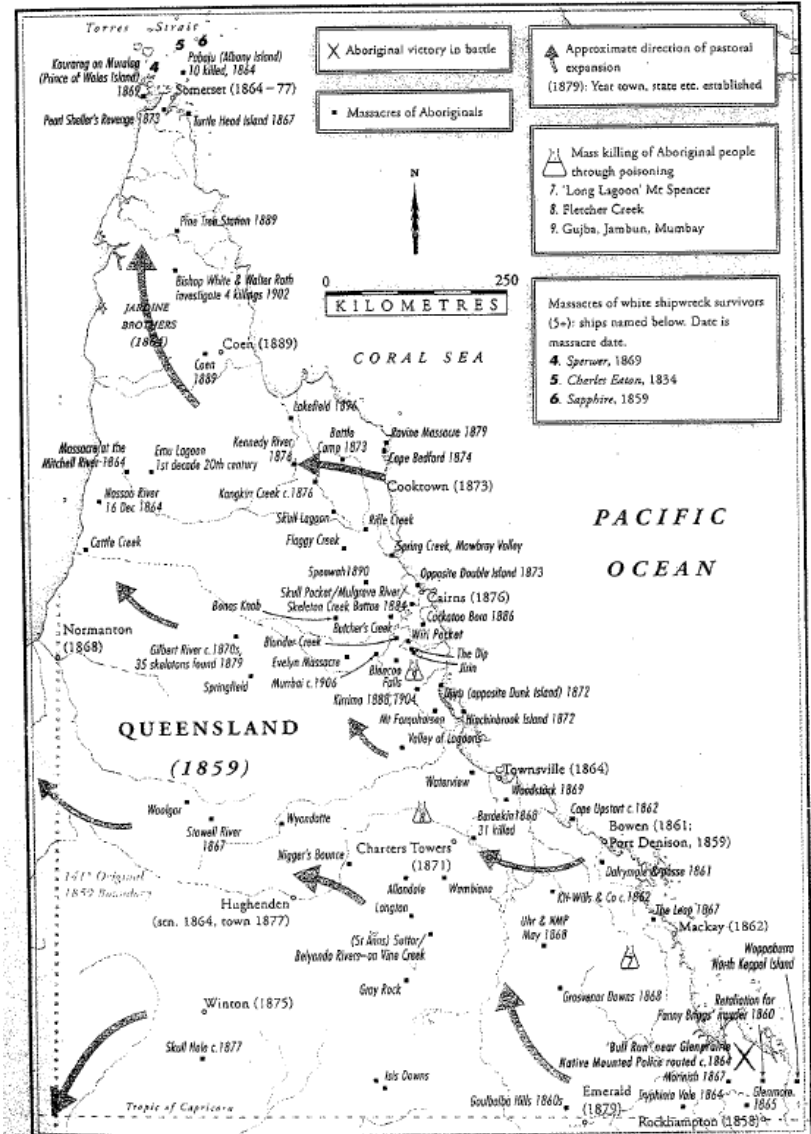
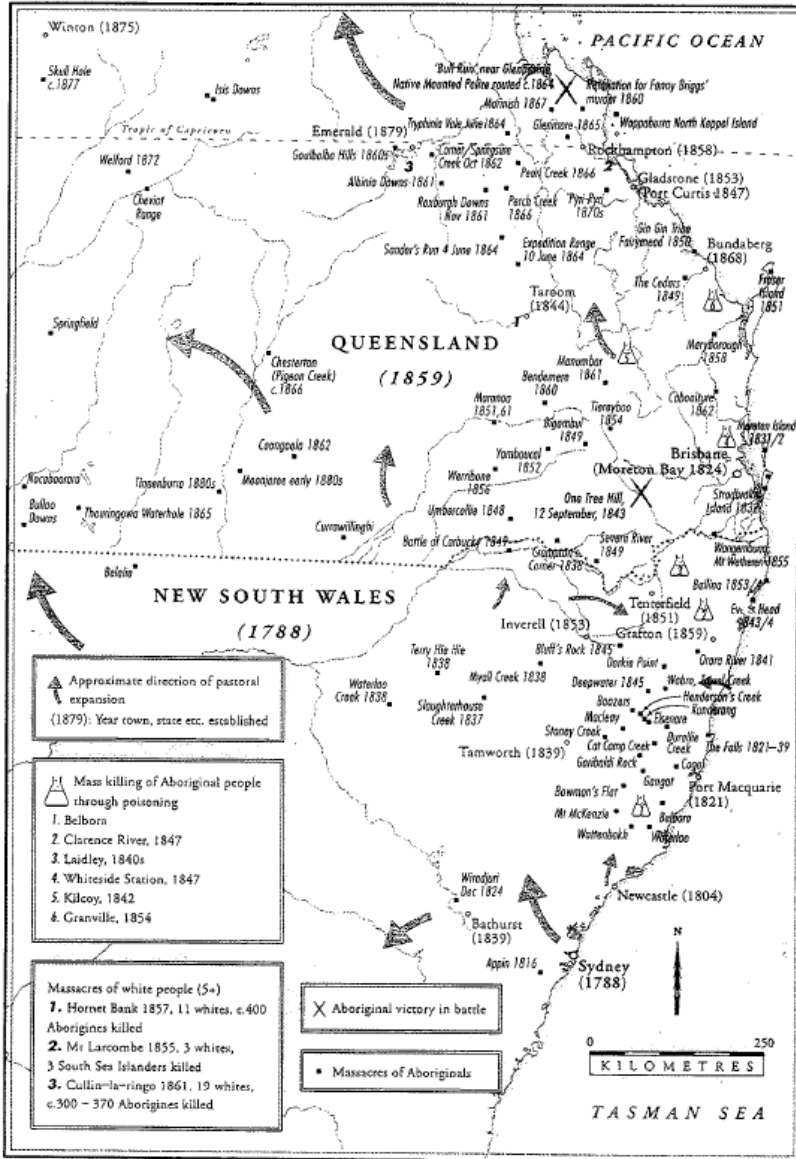


Source: Back-casting the minimum estimated counts of Aboriginal population in 1861 & 1871 from Smith (1980). The 1850 estimates are based on a back-cast of the earlier population counts assuming a constant growth rate from 1861 & 1871 to infer likely population in each state in 1850. Depopulation rates are then applied using the range of scenarios outlined in Butlin (1994a: 123)

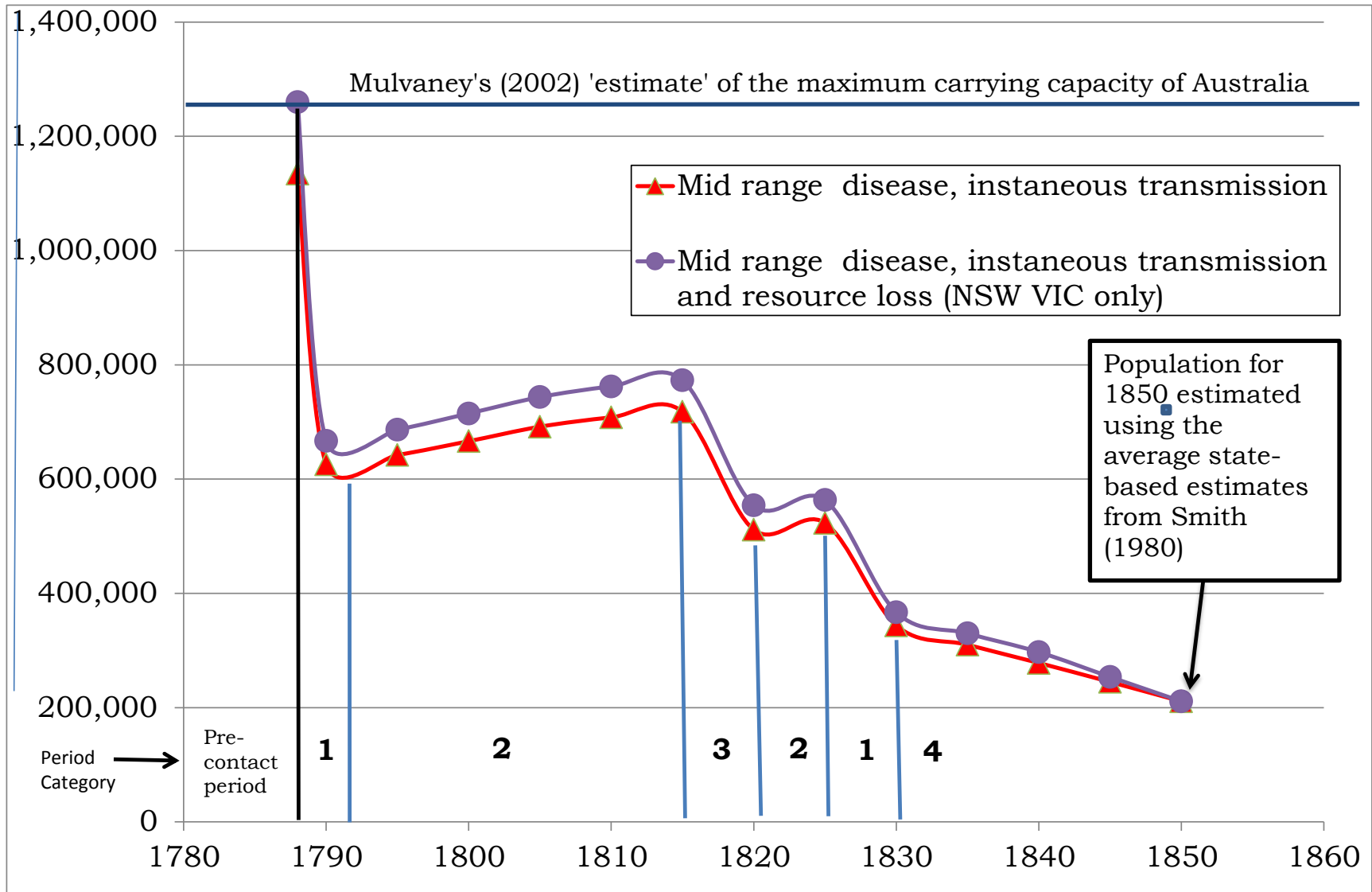
Problematic assumptions for estimating the pre-contact Aboriginal population

- ❖ There are important choices to be made generate estimates of pre-contact Aboriginal population:
 - ❑ When is the end of the pre-contact period 1788, or an earlier period?
 - ❑ What is the best population to use in creating a back cast of the pre-colonial population?
 - ❑ Disease is the main driver of depopulation in these scenarios, but we need to understand which diseases were responsible in order to get a more refined appreciation of plausible transmission (infectiousness of respective diseases) & the consequences for mortality fertility etc
- ❖ Butlin's parameters are based on specific diseases identified in SE Australia
- ❖ Above abstracts from other factors such as resource loss & Aboriginal response (economic/demographic as well as physical resistance)
 - ❑ Reynolds (1998) 20,000 violent deaths from frontier violence.

Some Massacres on the Frontier (Bottoms 2013: xii-xiii)



Aboriginal population trajectories & resource loss, 1788-1850 (Butlin-based scenarios)



- ❖ Period 1 is the initial outbreak of disease that is most often assumed to be small pox due to the high mortality rates (also likely to include TB, which can kill up to 50%, especially as European settlement progresses)
- ❖ Period 2 are times of population recovery: These are shorter in duration as dispossession proceeds (NB 2nd period 2 is truncated by outbreaks of small pox in South and East Australia)
- ❖ Period 3 is associated with TB & VD
- ❖ Period 4 is where the Indigenous population no longer grows possibly because of the sheer number of diseases being transmitted & the interaction between diseases exacerbating mortality & morbidity

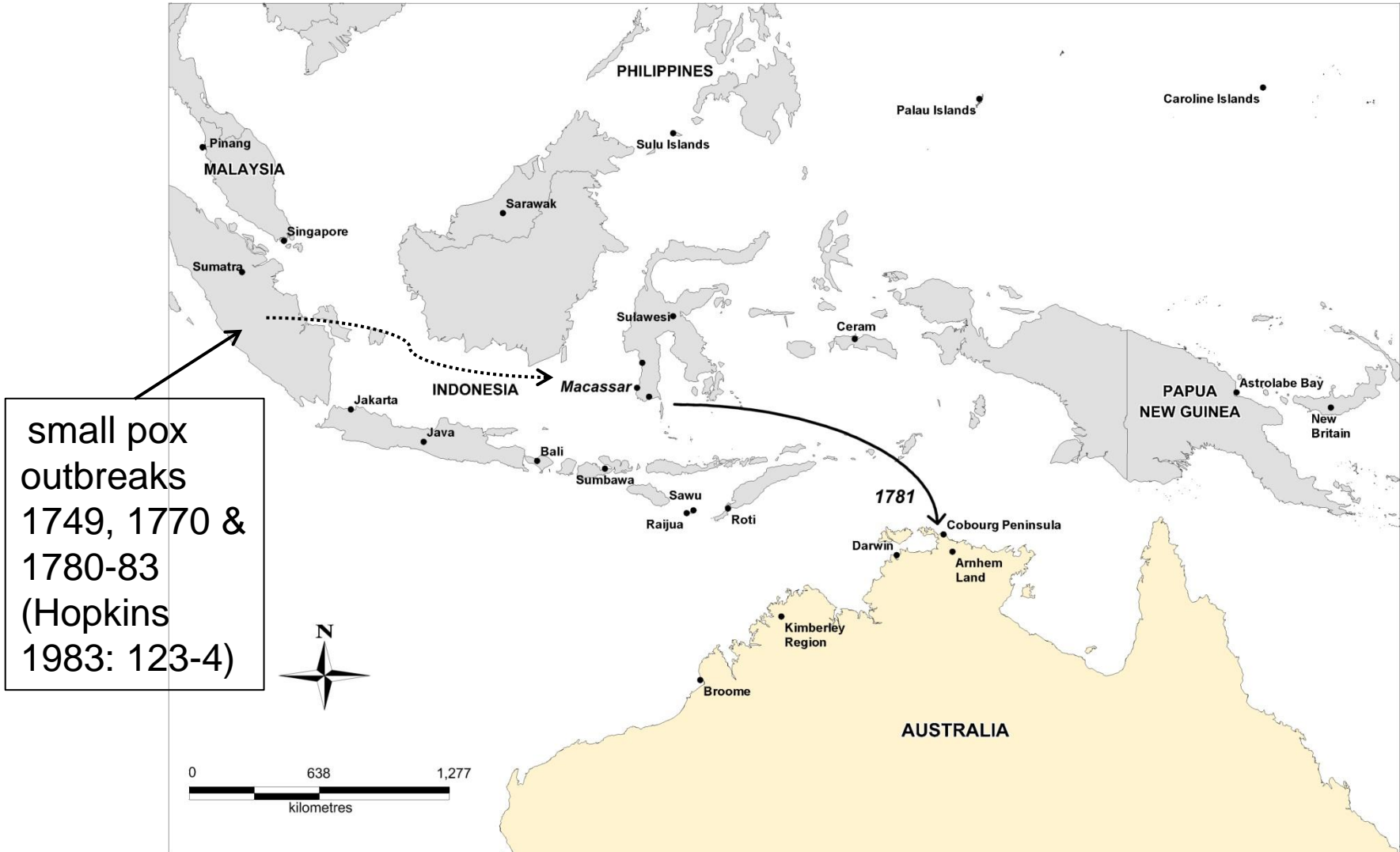
- A person with small pox sheds viruses into the immediate environment from the rash on skin & open sores in throat. Person remains infectious just before rash appears until the last scab drops off about 3 weeks later, but is most highly contagious in the first days of that period. Most victims acquire the virus through droplet infection while face-to-face contact with a patient by inhaling contaminate air. Not all people exposed to the virus become infected (10-20%). Around the 9th day of infection first signs & symptoms appear headaches fever chills nausea, backache sometimes with convulsions & delirium (p.3-4). Incubation usually <12 days. See Hopkins (1983)
- Given rate of infection, needs relatively dense population for transmission (Butlin 1983 & Fenner pers. com. Carmody)

- The estimates in the previous graphic extrapolate from Butlin (1993), which is implicitly based on the assumption that the relevant diseases are so infectious that they will transmit across the continent more-or-less instantaneously. But not necessarily true for small pox that need close physical proximity & density of population for infection to occur
- Butlin's disease scenarios are designed for NSW & Victoria but can they be used for the rest of the country? Strongest assumption for back-casting?

A brief history of small pox

- Small pox found on the pharaohs' mummy circa 1570 BC
- International evidence on de-population of native American population after Columbus is between 50% & 98% (Stannard's 95% rule of thumb) ..small pox is assumed to be the main culprit
- By 1750, small pox had spread eastward from Europe & the Asian mainland along major trading routes resulting in virgin soil outbreaks across south-east Asia (including Sumatra)
- Between 1780-83, small pox was endemic across Sumatra with 1/3 of the population dying (Hopkins 1983: 123-4). May have spread to the other islands of the Indonesian archipelago north of Australia given active trade routes.
- Also substantial contact & trade with Macassans (South Sulawesi), harvested Trepang (sea cucumber) off Northern Territory since mid 18th Century
- Campbell (2002) argues that small pox introduced in Northern Australia after 1780 & arrived in Sydney in April 1789.

Small pox 1780/81 outbreak on Cobourg Peninsula?



Small pox outbreaks in 1780s (Campbell 2002: 85)



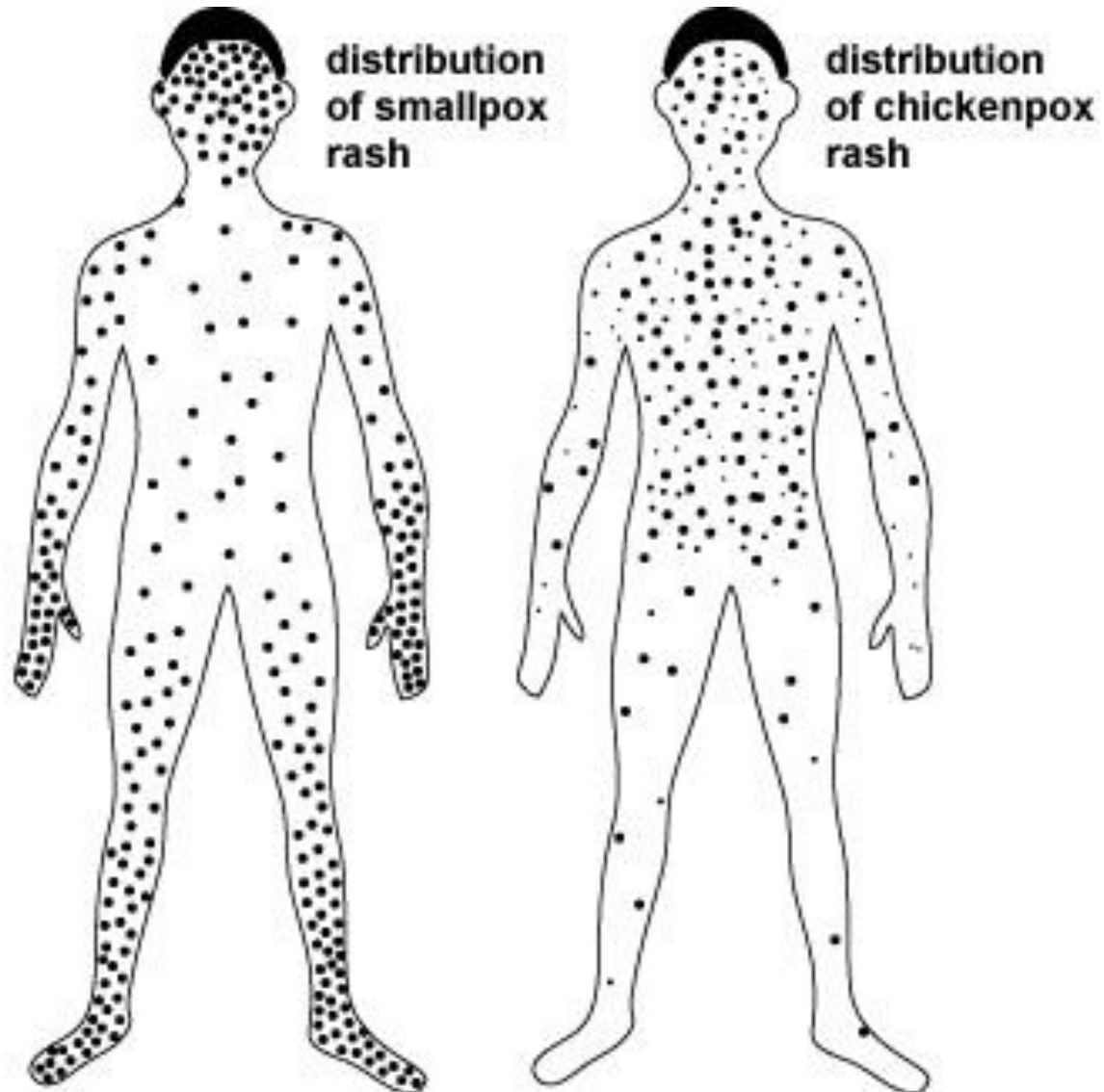
Key: ● outbreak H hypothetical outbreak

Small pox spread from Port Jackson from April 1789?

- In April 1789, Watkin Tench wrote in his *Complete Account of the Settlement at Port Jackson*:

An extraordinary calamity was now observed among the natives. Repeated accounts, brought by our boats, of finding bodies of the Indians (sic) in all the coves & inlets of the harbour, caused the gentlemen of our hospital to procure some of them for the purposes of examination & anatomy. On inspection, it appeared that all parties had died a natural death. Pustules, **similar** to those occasioned in the small pox, were thickly spread on the bodies'
- Small pox (*Variola*) & chicken-pox (*Varicella*) were only clearly distinguished in August 1767, when Dr William Heberden's presented paper to the Royal College of Physicians
 - ❑ naval surgeons trained through apprenticeships & may not have read the Proceedings of the Royal College
- Butlin (1983) & others favour the small pox from Port Jackson in 1789. Furthermore Butlin claims that the release was deliberately released by 'variola matter' from First Fleet (which allegedly survived 3 hot summers?)
 - ❑ But not a single case of small pox recorded among colonists

Small pox versus chicken pox revisited



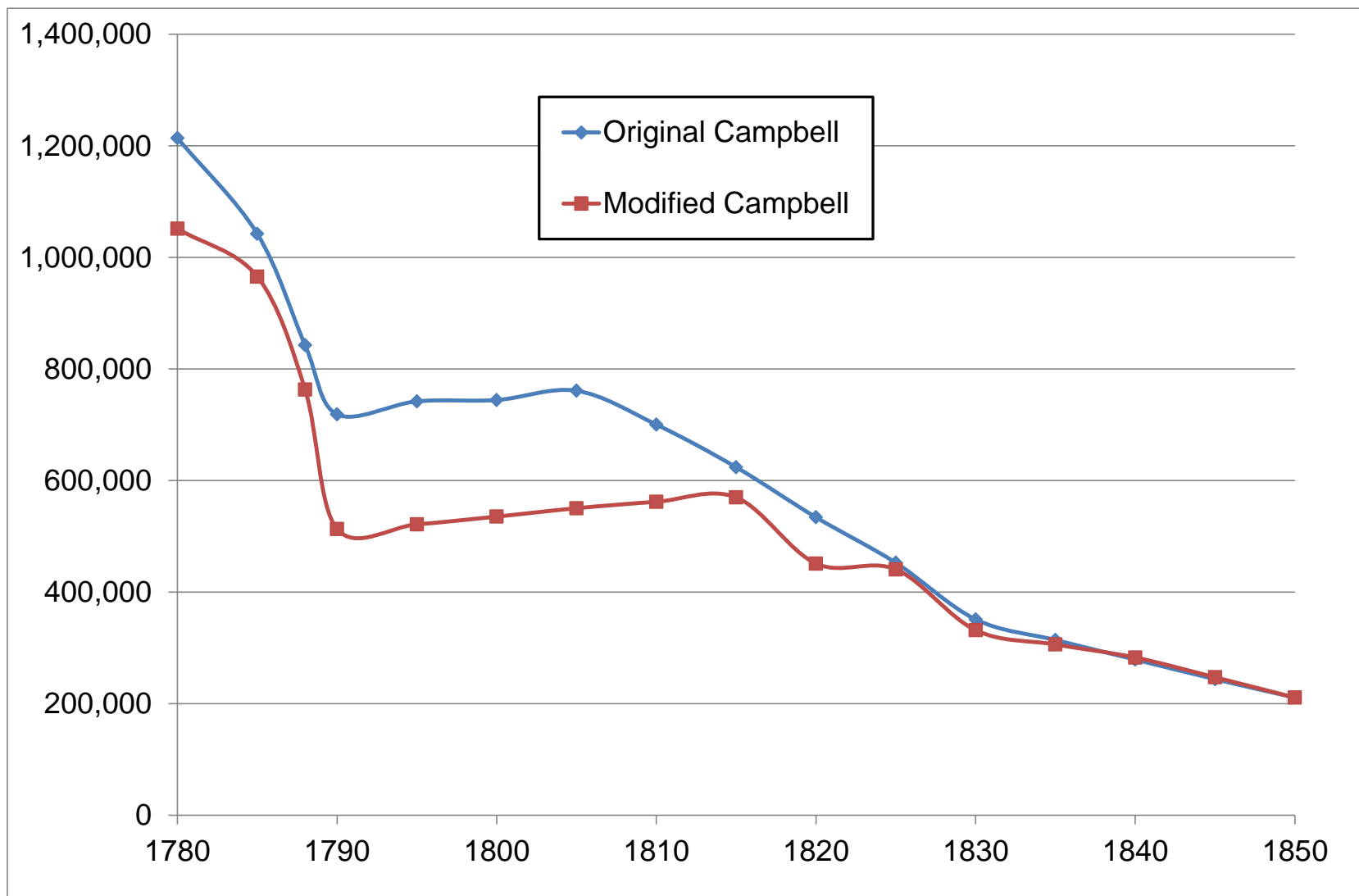
Transmission of small pox & chicken pox revisited

- Chicken pox is about five times more infectious than small pox (70-100% as opposed to 10-20%)
 - ❑ Hence fast nationwide transmission is more plausible
- Chicken pox also more plausible, as virtually every member of the colonist party would have contracted *Varicella* in their childhood, then a proportion of them would have developed 'Shingles' (*Herpes Zoster*) during the first year or so of their residence at Sydney Cove, because this disease, a further manifestation of *Varicella* infection, erupts when immunity is reduced (e.g. with increasing age or under stressful circumstances, as certainly existed in the colony, especially with poor diet & generally reduced resistance to disease being common). Those shingles lesions are, like primary chicken pox itself, highly infectious.

Three scenarios for back-casting

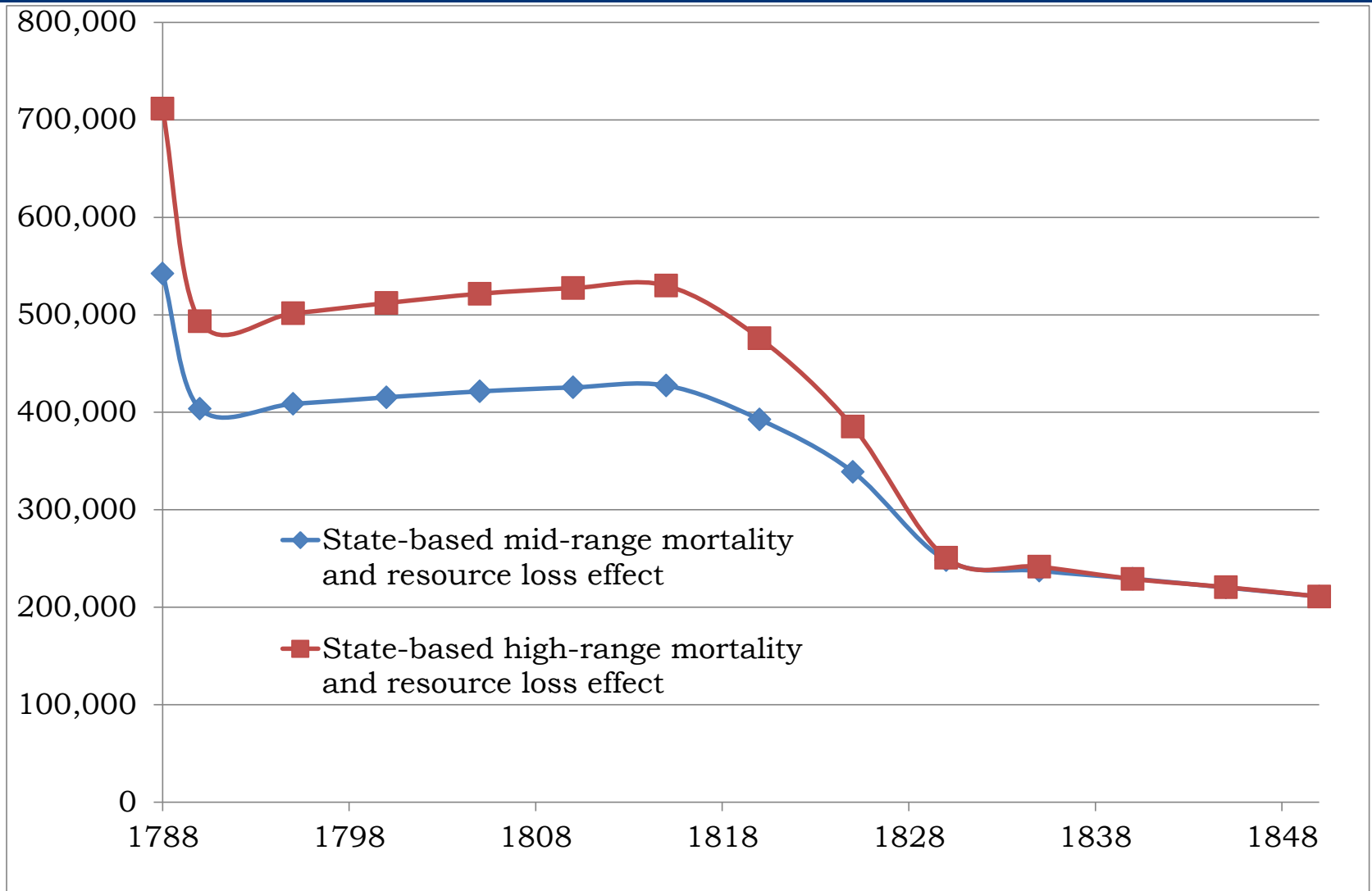
- Campbell-like scenarios: Small pox introduced in 1780-1 in NT & transmitted around the east coast to Port Jackson by 1789. Gradual transmission kept going to southeast corner of SA at a similar rate. Low densities in desert barriers to transmission to WA & many parts of SA & NT till colonial expansion. Mid range mortality estimates for small pox assumed.
- Butlin-based scenario with mid and high range mortality adjusted so that assume that infection only occurs as colonisation proceeds (i.e. increased exposure to Europeans potentially with diseases).
- Chicken pox, fast transmission scenario across continent from Port Jackson (but discount possibility of Macassan infection of chicken pox)
 - ❑ Chicken pox more prevalent among Europeans & less stress on the Macassans who stayed lived in relative harmony with Yolgnu

Campbell-based simulations, 1780-1850 (Scenario 1)



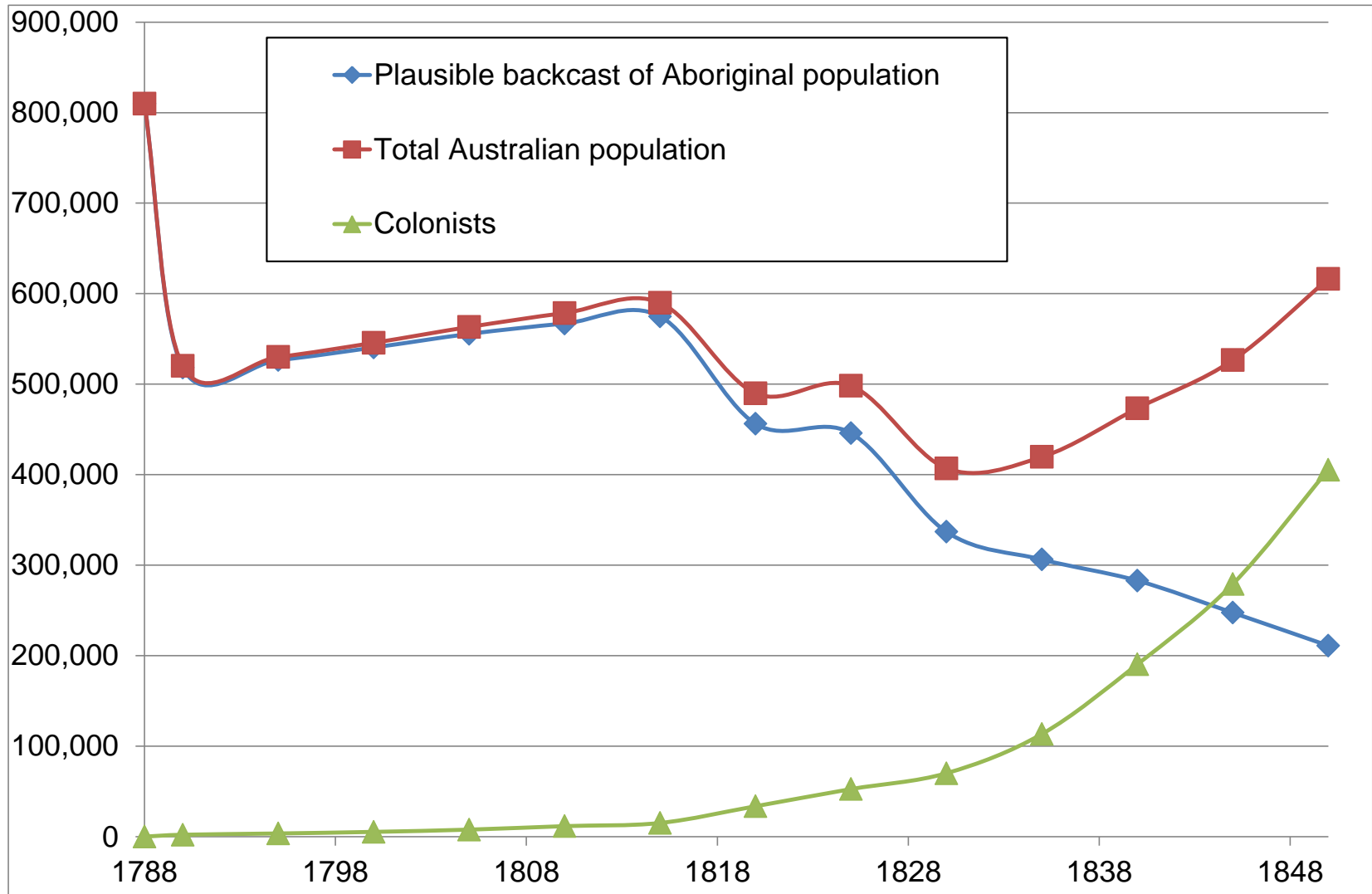
Sources: Original Campbell (2002) seems to imply that small pox outbreaks were widespread in 1780s. Modified Campbell assumes that Smallpox spread around relatively densely population sea boarder to Sydney in 1789 (then onto SA by 1795)

Small pox & other diseases spread by Colonial expansion, 1788-1850 (Scenario 2)



Sources: Butlin's mid and high-range mortality in population without herd immunity implies 50% and 60% mortality. Resource loss effect estimated above, adds to the population in NSW and Victoria only

Population takeover: Aboriginal & Colonist populations, 1788-1850 (Scenario 3)



Pre-contact Aboriginal population and % outside the south-east corner of continent

Population, Transmission of disease and mortality	NT(%)	Qld(%)	WA(%)	Outside SE Australia (%)
Radcliffe Brown	14	40	21	75
Modified Campbell hypothesis	21	43	8	71
Original Campbell	31	37	7	75
State-based European				
High mortality	11	20	14	46
Mid-range mortality	13	21	15	49
Chickenpox	21	29	20	70
1901 Census	25	29	32	86
2006 Census	13	28	15	56

Insights for economic history of immediate post-contact period

- Need for greater transparency & consistency in analysis of economic history of Indigenous Australia
- Chicken pox fast transmission across continent & offers internally consistent estimates that are not inconsistent with the 'Mulvaney consensus'
- The 'History Wars' have made it difficult to talk about the extent of frontier violence & warfare in Australia, but notwithstanding the inadequacy of official records, other written & oral evidence means that the issue will not go away
- Given the likely size of the Indigenous population in early colonial period, it is reasonable to ask why indigenous workers were not used more to allay chronic labour shortages
 - ❑ Fundamental cultural/language/geographic differences, & frontier conflict?
- Hypothetical population trajectories could also be used to provide insight into the number of Indigenous people killed in frontier warfare (eg, Qld in 1870s)