In collaboration with colleagues in PNG, Vallely and co-workers are now conducting epidemiologic studies to see if the link holds up. At UNSW's Kirby Institute for Infection and Immunity in Society, another group is doing lab studies with foreskins from PNG to explore fundamental mechanistic questions: How does medical circumcision thwart HIV, and does traditional cutting have any impact (see sidebar, right)? Vallely says if traditional penile cutting does prove capable of lowering the risk of HIV infection, it may ultimately alter public health campaigns. “We don’t want to stop something that prevents HIV from taking off in PNG,” he says.

Watson maintains that confusion about the epidemic’s contours and its drivers wastes precious resources. In 2012, most government spending went toward managing the response, not delivering services like prevention, treatment, and care. “We have a very top-heavy national response that gobbles up nearly 80% of the funding,” he says, noting that the National AIDS Council employs more than 100 people.

The painful Catch-22 is that PNG is left with little money to improve surveillance and figure out how best to curtail its epidemic. “We don’t have the resources for that because we’re still responding to an epidemic we don’t have,” Watson says.

Stuart Turville had a surprising item to declare last September when he arrived here from Papua New Guinea (PNG) on a Friday evening flight: a cooler that contained five freshly harvested foreskins packed on ice. “Coming in with samples like this is always somewhat amusing to customs officials in Australia,” says Turville, a virologist at the Kirby Institute for Infection and Immunity in Sydney.

Turville’s team regularly imports this precious cargo from its neighbor to answer a fundamental but under-explored question: How does male circumcision protect against HIV?

Studies have clearly shown that medical circumcision works, but confusion remains about the mechanism. Foreskins surgically removed from men in PNG who opt to go through medical circumcision offer an intriguing opportunity to address the question. Whereas some had fully intact foreskins, many had various traditional penile cuts as boys (see main story, p. 158).

Turville is leading lab studies that incubate these different foreskins with fluorescently labeled HIV (pictured). That allows researchers to assess how the transmission process is affected by factors that vary among the foreskins, including the degree of keratinization (in red) and the presence of immune target cells.

Surprisingly few groups have published studies about the protective mechanism of circumcision, says virologist Thomas Hope of Northwestern University’s Feinberg School of Medicine in Chicago, Illinois, a veteran researcher of foreskins and HIV who has begun collaborating with the Kirby Institute group. “And a lot of it is wrong.”
The circumcision conundrum

Science 345 (6193), 161.
DOI: 10.1126/science.345.6193.161