

Can elimination be sustained with the current tools – should we aim to break transmission?

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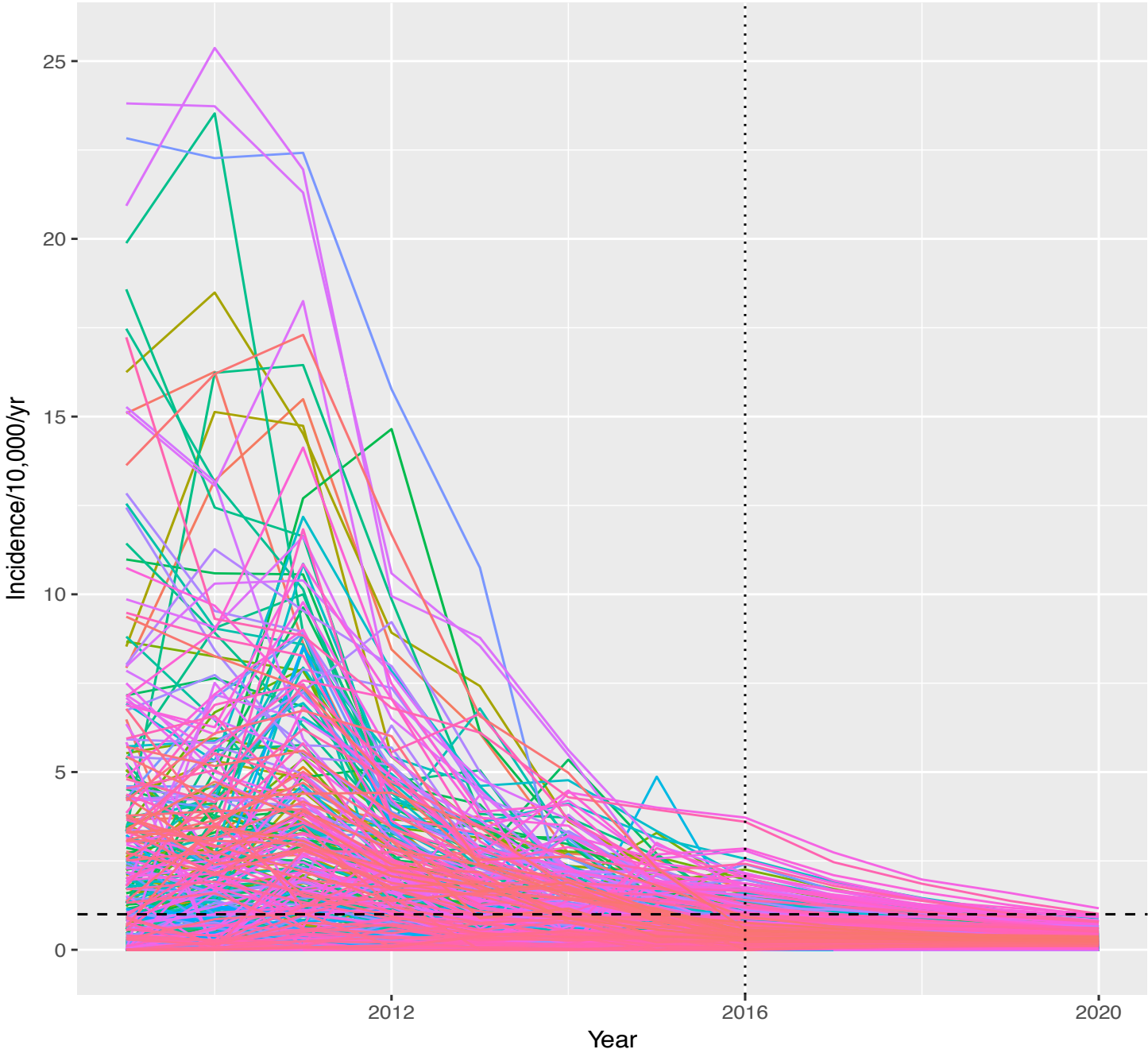
BILL & MELINDA
GATES *foundation*



Reduction in transmission of VL

- The current programme is working
- Elimination of VL as a public health problem is highly likely by end 2020
 - Some problematic districts / blocks
 - Depends on continued effort
 - Depends on discovery of extended endemic range
- Source of heterogeneity needs to be explored
 - Variation in sandfly density
 - Variation in diagnostic success and IRS application

Subdistrict-level KA incidence predictions up to 2020



Preliminary projections based on regression

One district remains >1/10,000 by 2020

Note the general pattern of increase 2009-2012, then fall

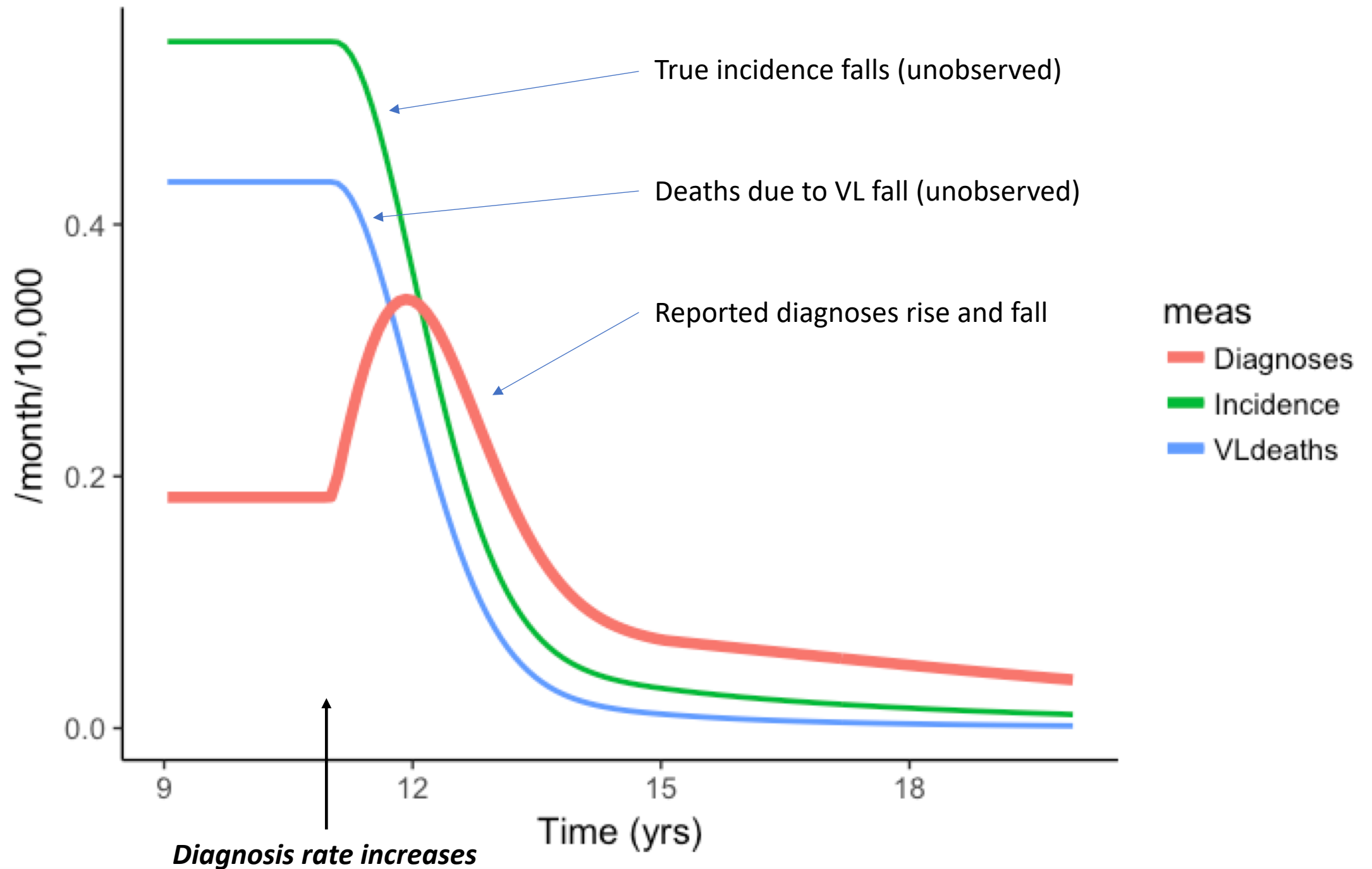


IRS and IDM

- Success is based on IRS and “Intensive Disease Management”
 - The relative contribution of each is unknown
 - Both have sound logic supporting them
 - Both are likely to have contributed to success, perhaps in different ways in different places
- Diagnostic effort is critical to both control and surveillance
 - Case detection are the surveillance data...
 - Active Case Detection ensures that passive case detection is working (or not)

“Test and Treat” Dynamics

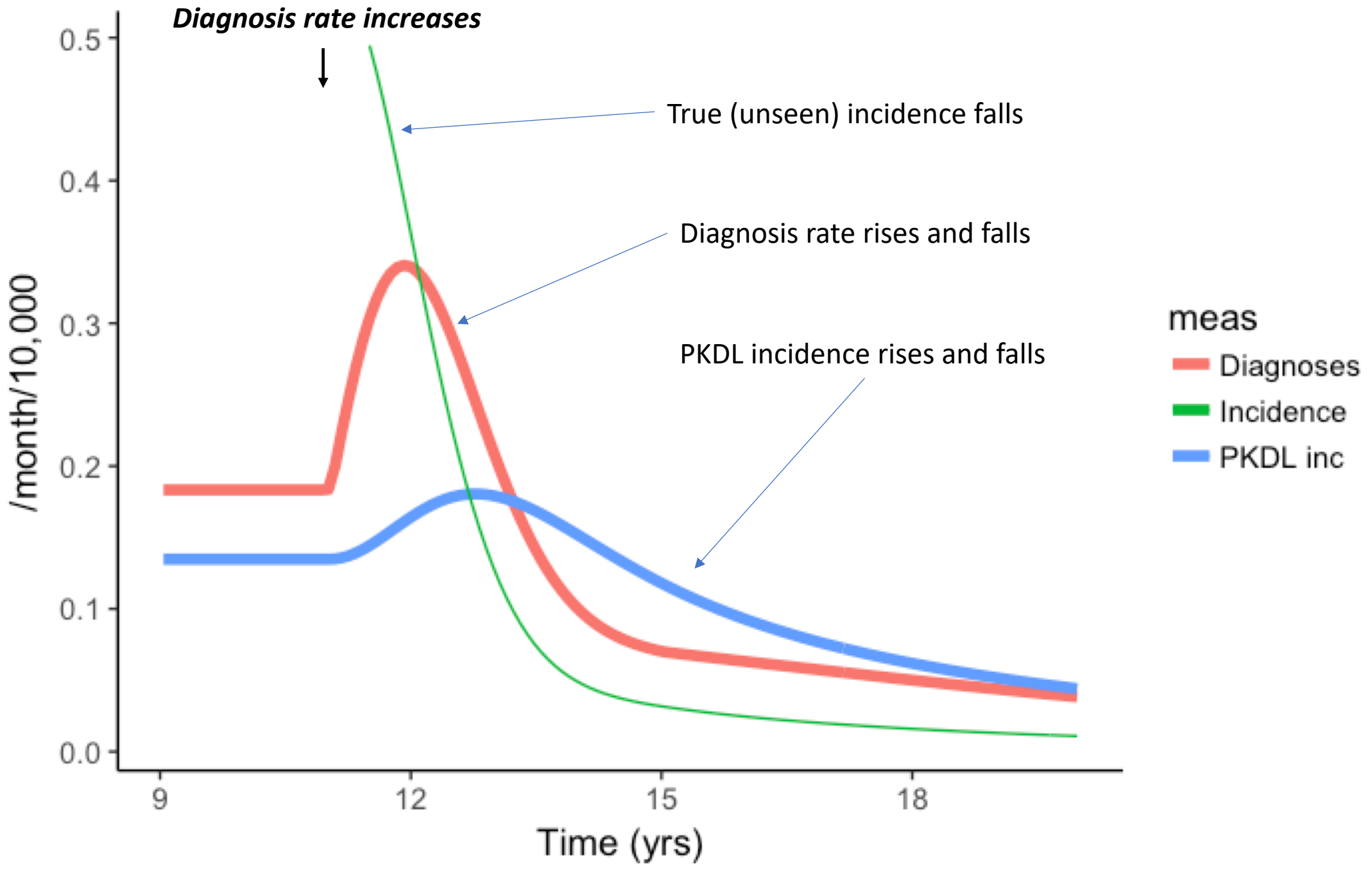
- There are two ways of having zero cases...
 - True zero
 - Apparent zero
- True zero requires intensive effort
 - Finding all cases early
 - Treating cases promptly
- Apparent zero requires no effort
- Successful elimination and post-elimination control of VL requires that all cases of VL are diagnosed and treated promptly
 - Ensures that zero is a true zero
 - Prevents resurgence of transmission and disease



PKDL – Expected Patterns

- PKDL is a consequence of successful diagnosis and treatment
 - More PKDL = Success!
- Increasing the rate of diagnosis and treatment is expected to produce an “epidemic” of PKDL
- If transmission is reduced, this epidemic should resolve

- This is strong evidence of the impact of IDM / ACD



Post-Elimination

- What will we do after 2020?
- Is true elimination possible?
 - “Elimination of transmission”
 - Reduction of transmission so that each case produces less than one case
- Have we already achieved true elimination?
 - Will the impact of IRS and ACD eventually result in true elimination?
 - Probably not... experience in Nepal of continued sub-clinical transmission
- Health system vigilance is required to ensure that zero is a true zero

Additional Interventions & Challenges

- Direct measurement of transmission
 - Xenomonitoring of vectors and markers of exposure in asymptomatics
 - Required because incidence of diagnoses is not a good measure of transmission at low incidence of infection
- Continued (improved) drug availability
 - Resistance and supply are both threats when there is only one drug
- Development of targeted vector control
 - Reactive-IRS, bednets?
- Regional co-operation and action
 - True elimination is only possible if it is simultaneously achieved in every district, state and country

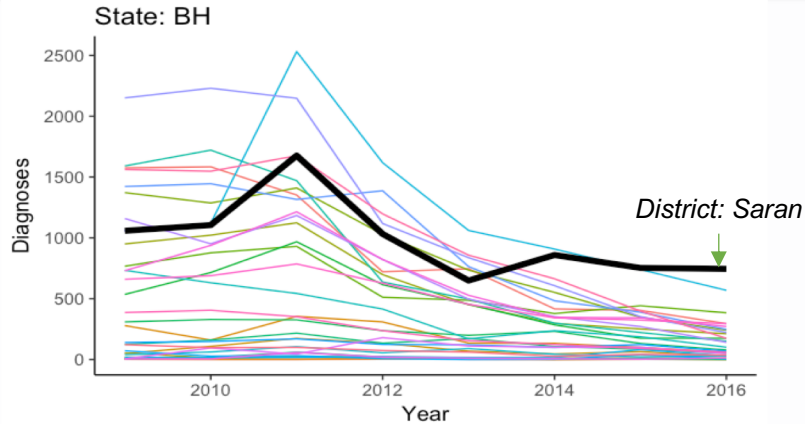
Danger of not gaining True Elimination

- In 2020 we will be diagnosing relatively few cases
- Over time the population will become increasingly susceptible
 - Transmission is reduced – most children will not be exposed
- Historical evidence is that VL can produce large epidemics
 - We are already seeing village-level outbreaks ~ 3% attack rate
- The current programme of IRS and diagnostic effort must be maintained
- Vigilance and continued political engagement are required to ensure that post-2020 we do not

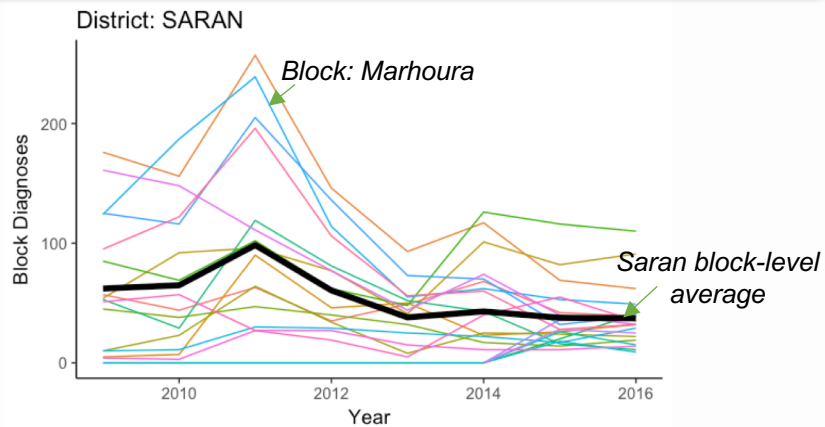
Modeling insights on heterogeneity of case incidence will help to predict outbreaks and test approaches to break transmission

While decline in case incidence has been consistent at block and district levels, incidence is highly heterogenous

1.a) What are the sources of spatio-temporal heterogeneity?
(e.g. differences in access to care, sandfly density or other interactions)

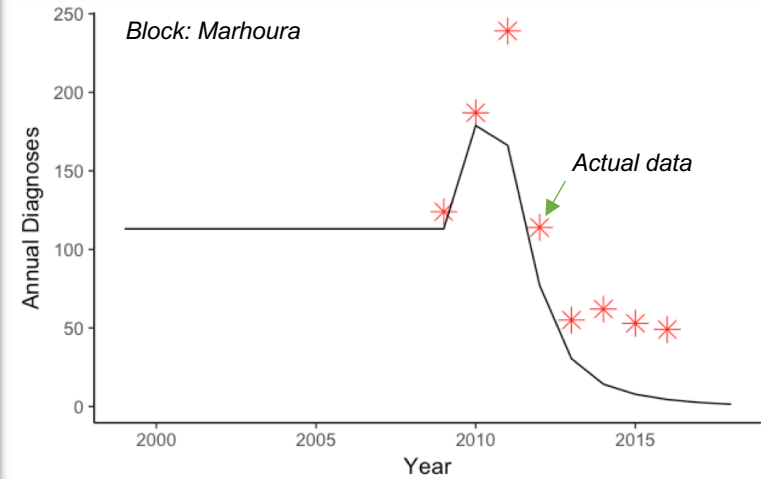


1.b) What are the drivers of case reduction?
(e.g. IRS or Active case management)

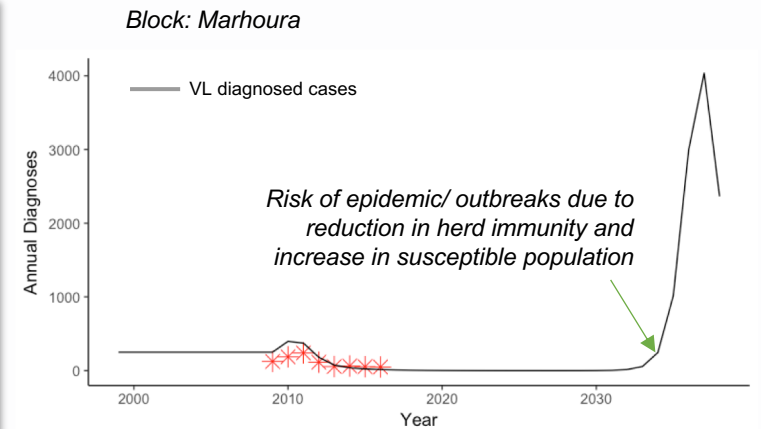


2) Can we develop a data-driven, model-based support tool for short-term prediction of likely areas of flare-up and outbreaks?

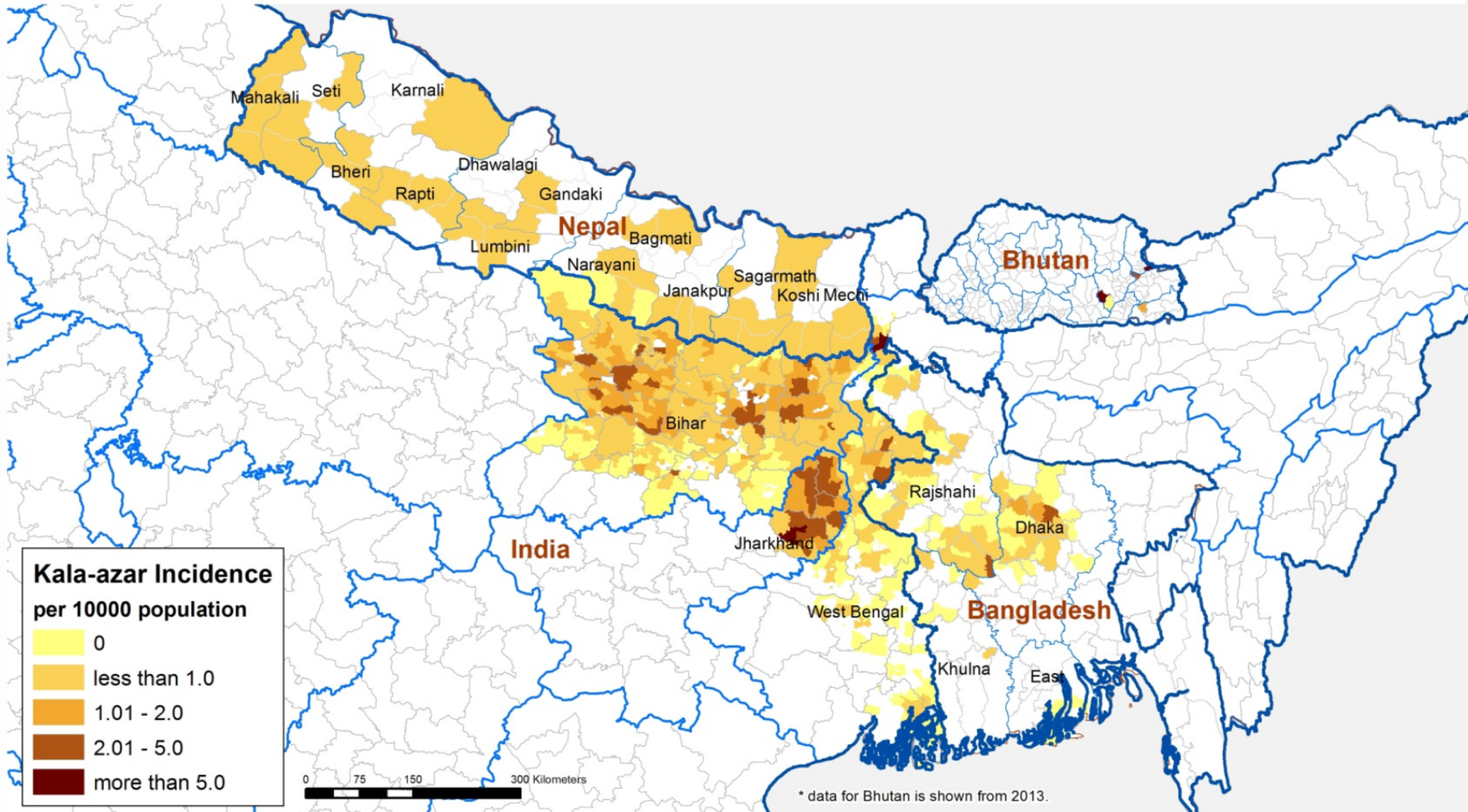
i We are collaborating with IDM to use *RiskMapper* platform as the basis for moving the technical capacity into NVBDCP



3) Can we model transmission dynamics to work out strategies to interrupt transmission using current tools (or newer approaches informed by operational research)?



Kala-azar Incidence (per 10000 population) in SEA Region in 2015



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World Health Organization 2016
Date : 02/11/2016



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