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Assessing productivity loss associated with immunization in LMICs

iHEA Immunization Economics Pre-Congress

Gatien de Broucker

Libby Watts



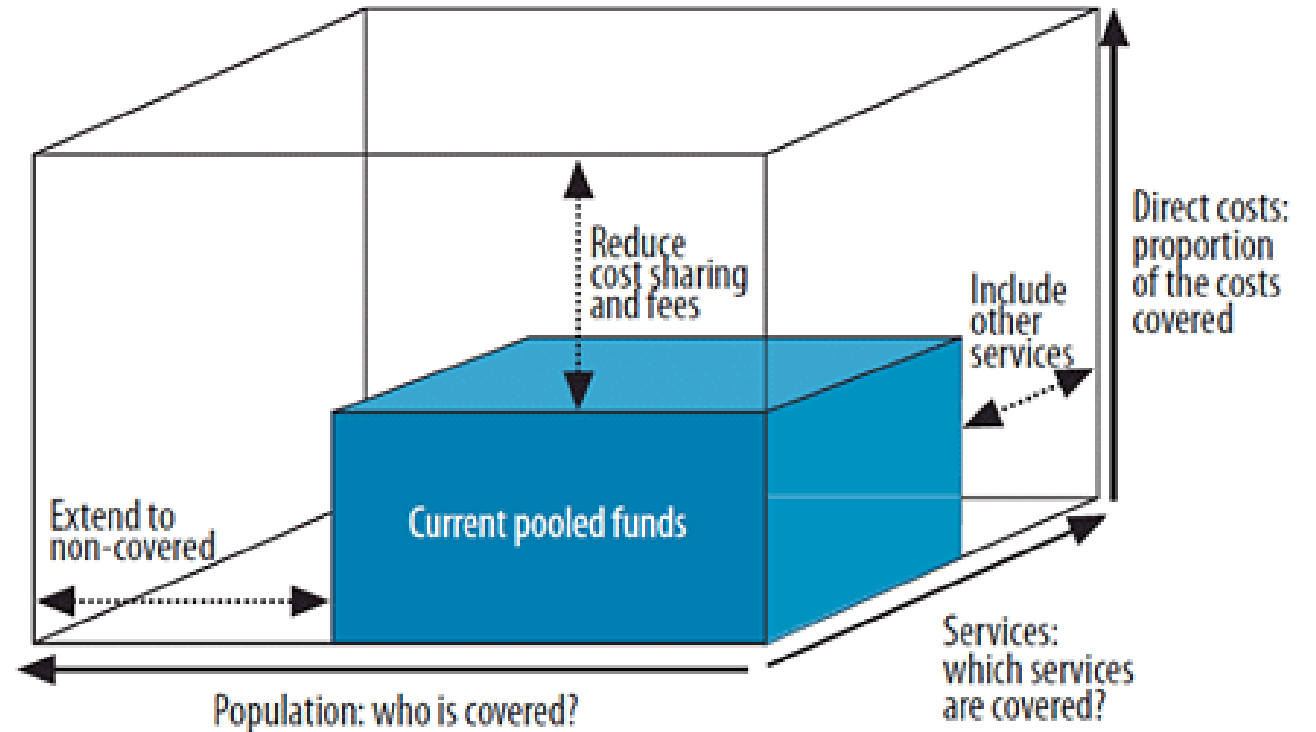
Outline

1. Indirect costs: Productivity loss and activities foregone
 - Methods of estimating indirect costs
2. Primary data collection from the DOVE Field Studies
Bottom-up approach
3. Approach in the DOVE economic benefits models
Large-scale modeling
4. Discussion



WHO framework for expanding Universal Health Coverage (UHC)

- What is missing from this framework?
- Apart from direct medical costs, what are other economic barriers to accessing healthcare?



Three dimensions to consider when moving towards universal coverage



Methods for Estimating Productivity Loss

Human capital approach

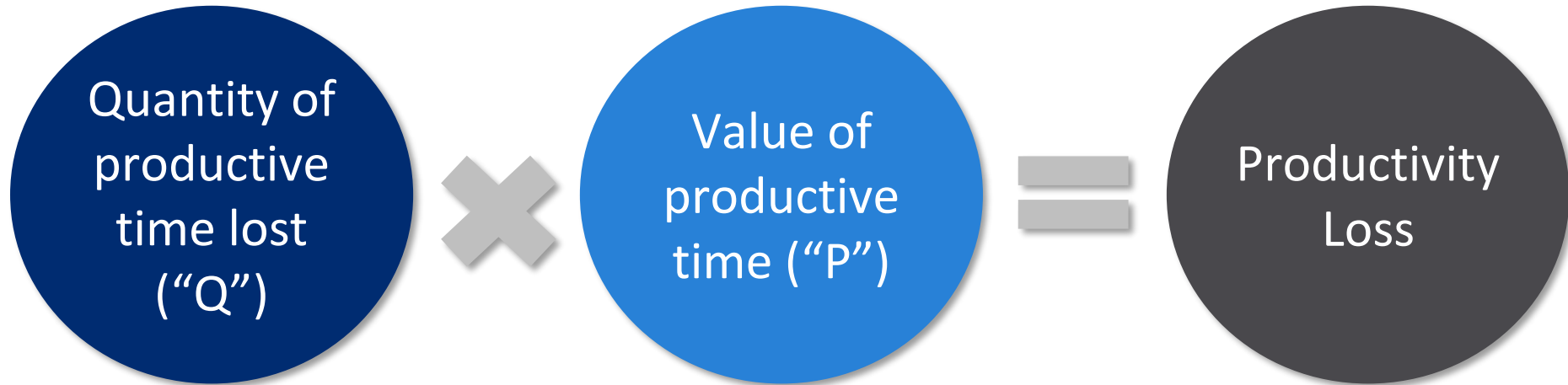
Counts all lost hours worked due to health-related conditions or treatments without considering substitute workers

Friction cost approach

Lost hours included in productivity loss estimate is limited to the time until another worker has fully replaced the individual who is absent due to an illness



Framework for estimating productivity loss



- How do we **identify** and **measure** productivity loss?
- How should we **value** productive time lost due to caregiving or illness?
- How should we **communicate** our findings to the audience?

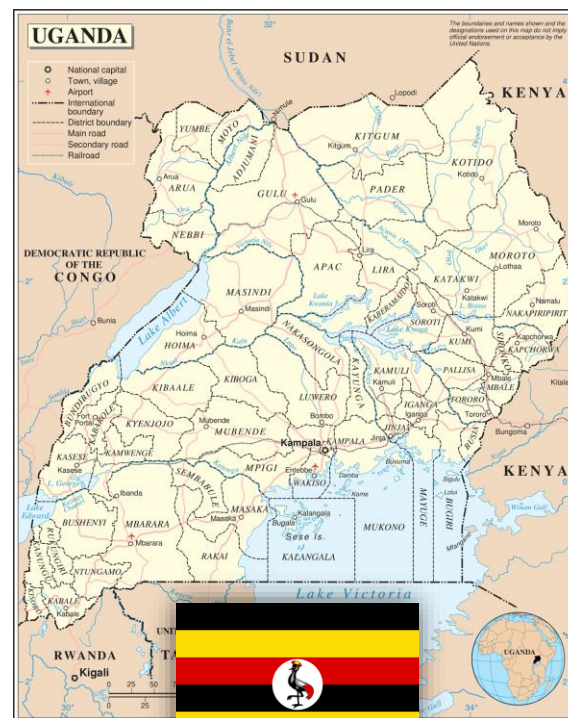


The *Decade Of Vaccine Economics* field study

- Assessed the **cost** of pneumonia, diarrhea and measles (in children <5) for households, the healthcare system and society
- Indirect costs estimated through the human capital approach
- Caregivers surveyed about:
 - Medical and non-medical expenses for current episode of illness
 - Wage-earners in the household (including themselves), their relationship to them and the child, their occupation and their income
 - Time spent by the caregiver and/or any other household member caring for the sick child **prior, during** and **after** the facility visit

PI: Dr. Bryan Patenaude

<http://immunizationeconomics.org/dove>





Challenges in estimating indirect costs

- Difficult to estimate the income loss related to **casual work**
 - No contract for work: it's up to the **respondent's best judgement to predict wage loss**
 - Agricultural workers, construction workers, vendors, etc. see their **income vary by season**
 - There are **coping mechanisms** that caregivers use to moderate their loss of income, which are difficult to capture (usually post-survey)
- Difficult to estimate the value of **unpaid work**





Example survey questions

Wage-earner's income

Information on wage-earner

Continuum of care

Time spent at previous facilities

Time spent at current healthcare facility

Time spent traveling to/from facilities

Time spent providing care prior to visit

Information on missed activity

I will now ask you about health care you sought for the sick child for the current illness before coming to this facility and about care you received at this facility.

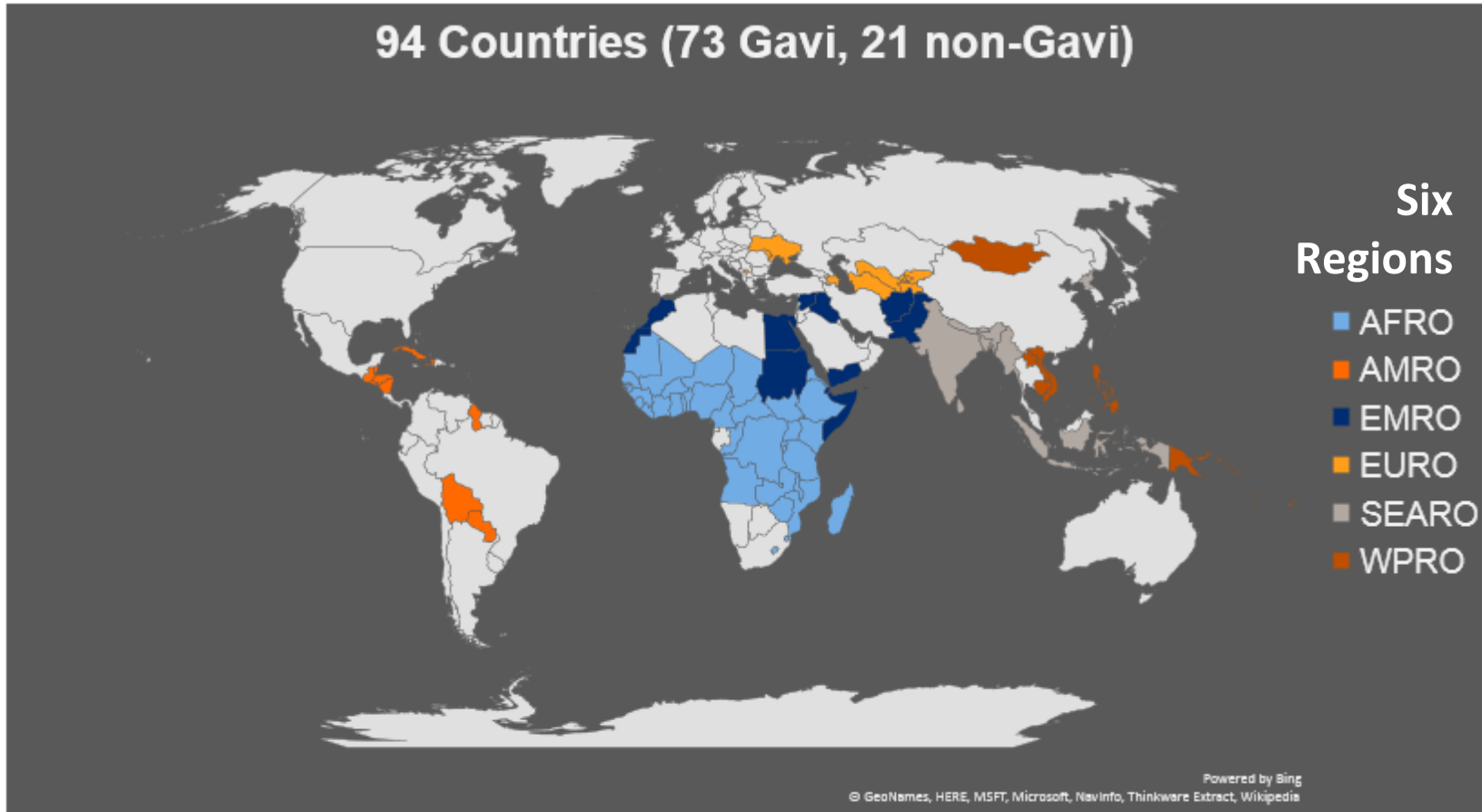
A Health facility type	B Have you sought care at any of these facilities? (Y/N)[Mark all that apply and include the current facility]	C In what order did you seek care? [Rank order]	D Was this a public or private facility?	E Were you admitted overnight at this facility? (Y/N)	F How long did you stay at this facility? (days, hours)
Hospital					Days <u>Hrs</u>
Health Center III-IV					Days <u>Hrs</u>

During this health facility visit, where has the child spent his/her time?	Waiting room	___Days	___ <u>Hrs</u>	___Min
	Outpatient area	___Days	___ <u>Hrs</u>	___Min
	Pediatric ward/inpatient bed	___Days	___ <u>Hrs</u>	___Min
	Intensive care unit	___Days	___ <u>Hrs</u>	___Min
	Emergency room	___Days	___ <u>Hrs</u>	___Min

Time spent per healthcare service



DOVE Economic Benefits Models



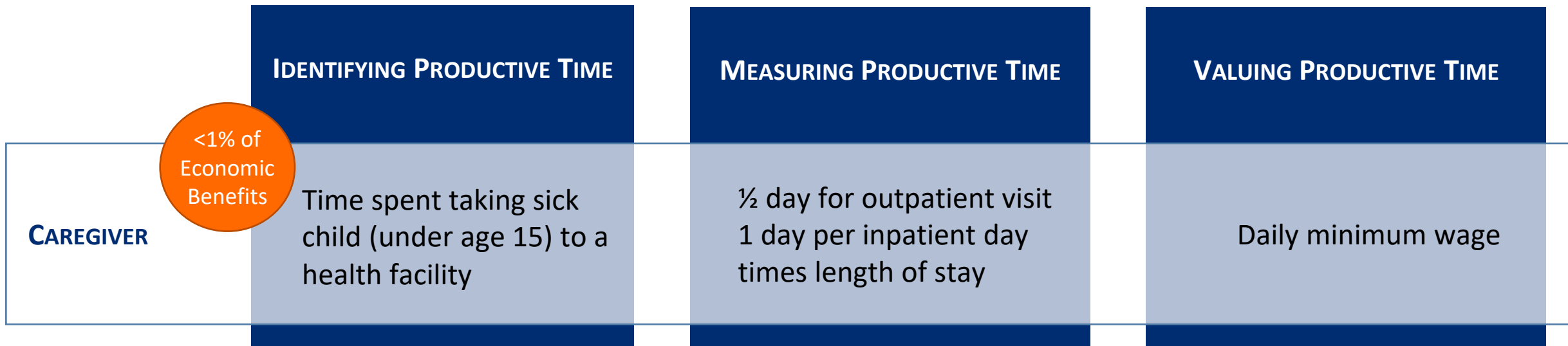
Ten Antigens
Measles
Yellow fever
<i>Haemophilus influenzae</i> type b
Japanese encephalitis
Hepatitis B
<i>Neisseria Meningitidis</i> serogroup A
Rubella
<i>Streptococcus pneumoniae</i>
Human papillomavirus
Rotavirus

Three Decades		
Historical Decade (2001-2010)	Decade of Vaccines (2011-2020)	Future Decade (2021-2030)



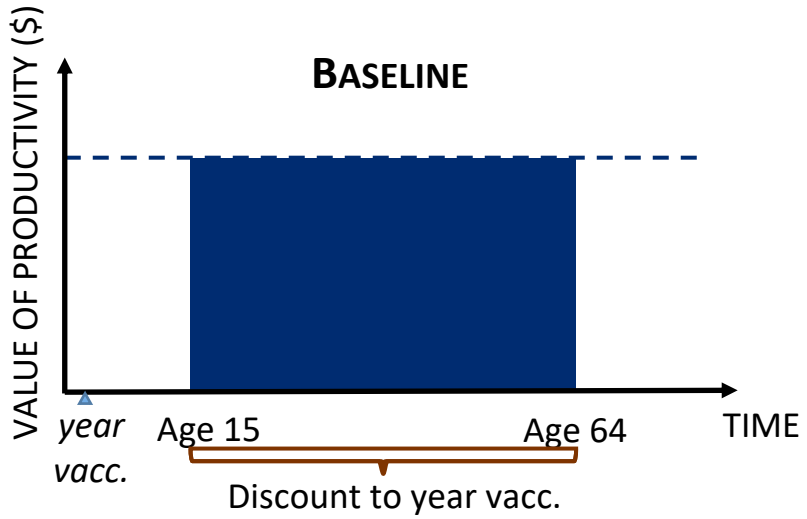


Productivity loss in the DOVE Economic Benefits models



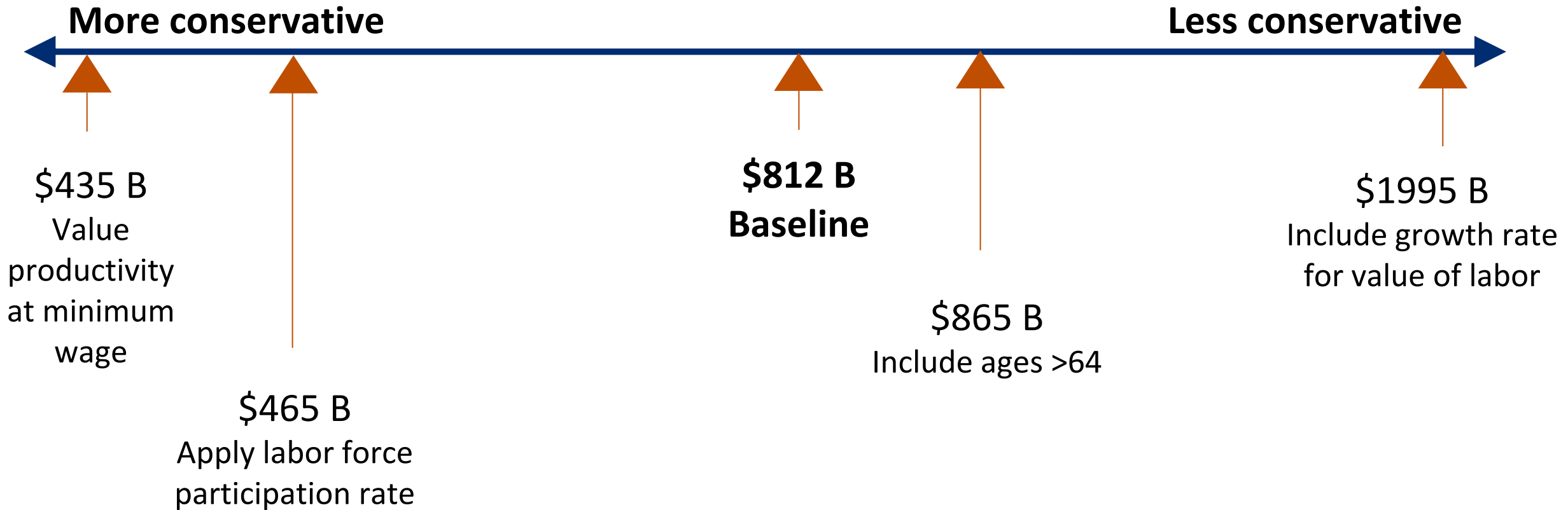


Methods explored in sensitivity analysis (vaccinated individuals)*





Impact of assumptions on productivity loss estimates (94 countries, 2021-2030)



*For full results, see poster EE12 at iHEA congress.



Discussion

- How do we account for household or caregiver coping mechanisms in primary data collection?
 - Should we account for coping mechanisms in modeling studies?
- How might gender roles impact how we conceptualize productivity loss?
- Lost earnings due to premature death is not commonly included in economic evaluations—should it be included when assessing the impact of vaccination?
- Should indirect costs be included in economic evaluations of UHC?



Takeaways

- Methods for *identifying, measuring, valuing* productivity should be transparent and explainable
- Alternative assumptions should be explored in sensitivity or scenario analysis
- Discussions on how to include indirect costs in economic evaluations should continue!

Thank you!



Contact Information

- For more information on how productivity loss is estimated in the DOVE project, please email Gatien (gdebroucker@jhu.edu) or Libby (ewatts13@jhu.edu)