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JOHNS HOPKINS
BLOOMBERG
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Calculating the HeaLY, Part 2

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Interventions

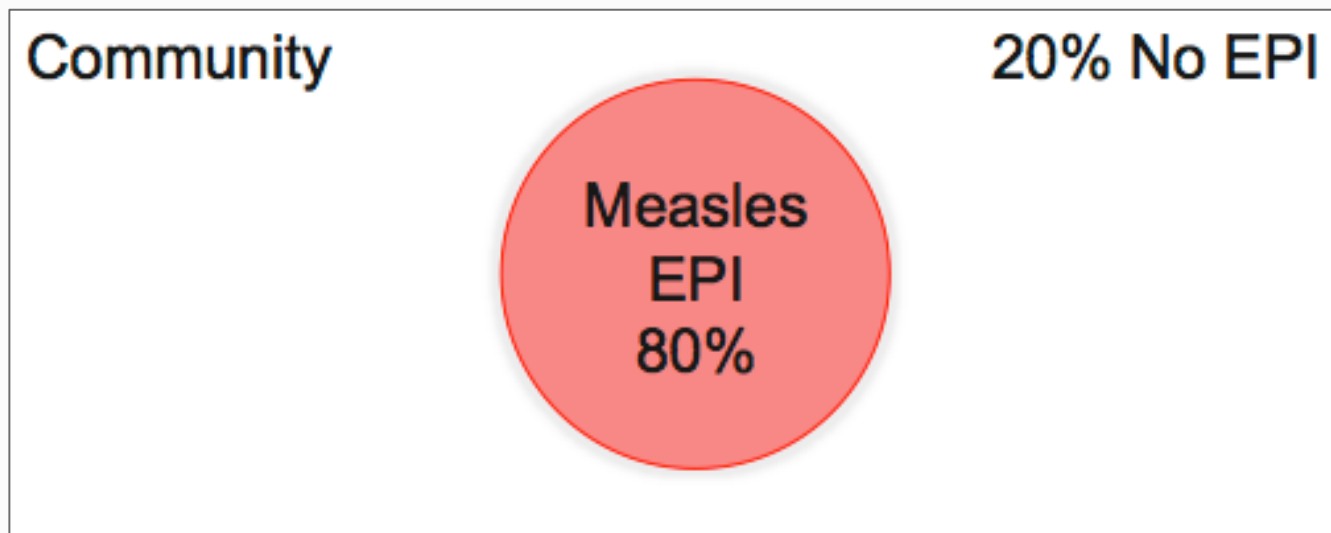
- Intervention is a term used to designate any sort of deliberate action taken in order to improve the health of an individual or population by reducing disease and the consequences of disease
- Interventions may be directed against disease or against risk factors that lead to disease
- They can be categorized as preventive (reducing incidence) or therapeutic (reducing case fatality or case disability or extending life)

Major Classes of Interventions Include ...

- Preventive
 - Immunizations; drugs for prophylaxis; vector control; environmental alterations; behavior change through education, taxation, legislation, and law enforcement
- Therapeutic
 - Drugs for treatment; drugs for extending life; some immunizations; behavior change
- Some specific interventions are used for both preventive and therapeutic purposes

Definitions

- **Cov1: coverage** = proportion of the target population who obtain the intervention (%)
 - Target population = those who should obtain the intervention



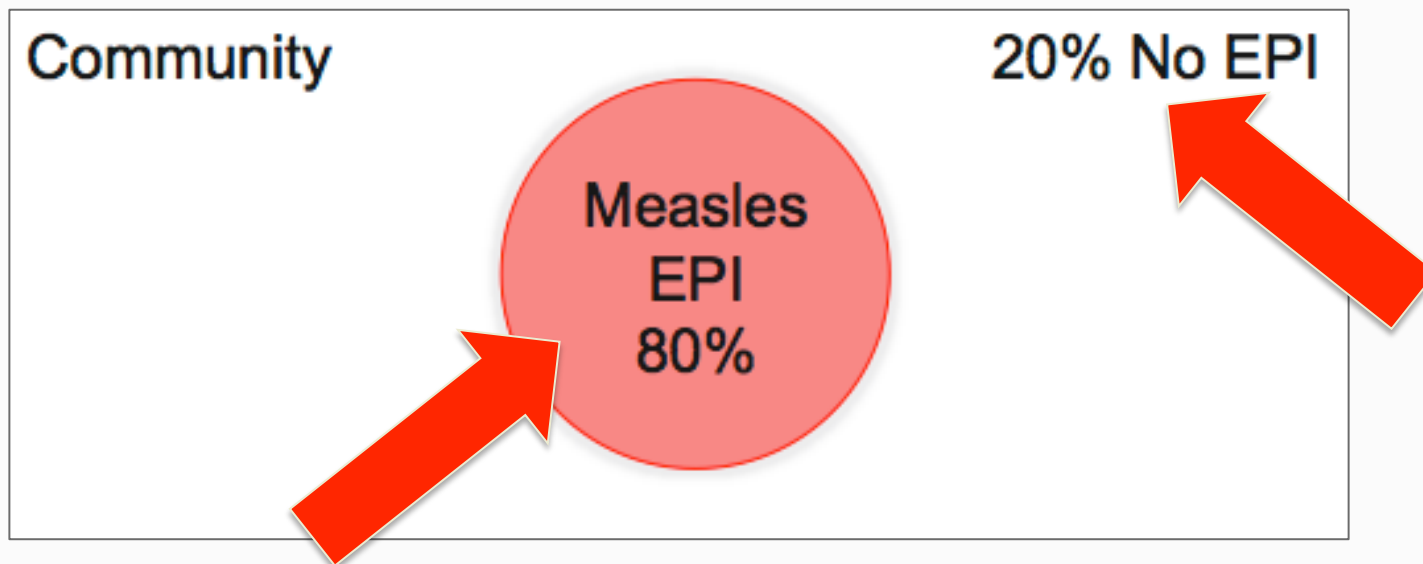
Definitions

- **Incto:** incidence reduced to
 - Equals one minus the efficacy of the intervention on incidence
 - E.g., measles EPI program = 90% effective, i.e., incidence is reduced by 90%
 - ▶ $1 - 0.9 = 0.1$

Definitions

- **New incidence** = Inc (B2) * (incidence in those who were immunized + incidence in those NOT immunized)

$$\rightarrow \text{Inc} ((\text{Cov1} * \text{Incto}) + (1 - \text{Cov1}))$$



Definitions

- **CFR_{to}** = (1 – efficacy of intervention on CFR)
 - E.g., cholera MFU (medical field unit) reduced CFR to 0.3 of original CFR
 - Therefore, new CFR = CFR (C2) * (CFR in those who received intervention + CFR of those who did not)
$$\text{CFR} * ((\text{Cov1} * \text{CFR}_{\text{to}}) + (1 - \text{Cov1}))$$
 - NB some interventions may reduce incidence but have no effect on CFR

Definitions

- **Dto** = (1 – efficacy of intervention on disability)
 - E.g., malaria OPD reduced disability to 0.25 of original disability

HeaLYs Lost as a Result of Intervention

- Use same equation as before but input *new* variables
- Old equation
= $\text{Inc} * ((\text{CFR} * \text{dcExF}) + (\text{CDR} * \text{ExtD} * \text{dcDt}))$

HeaLYs Lost as a Result of Intervention

- $\text{Inc}^* ((\text{CFR} * \text{dcExF}) + (\text{CDR} * \text{ExtD} * \text{dcDt}))$
 - { $\text{Inc} ((\text{Cov1} * \text{Incto}) + (1 - \text{Cov1}))$ }
 - { $\text{CFR} ((\text{Cov1} * \text{CFRto}) + (1 - \text{Cov1}))$ }
 - { $\text{CDR} * \text{ExtD} * \text{dcDt} * \text{Dto}$ }