



# FACTORS THAT CONTRIBUTE TO RE-EMERGENCE OF MEASLES

## High income countries vs low/middle income countries

By Carreon, I., Egbudin, L., Kamara, J., Mattara, Z., Omidiran, Y.

### MEASLES Epidemiology

•Despite having a safe and cost-effective vaccine available, in 2018, there were over 140 000 measles deaths globally<sup>1</sup>

•Between 2000 and 2018, the measles vaccination prevented an estimated 23.2 million deaths. - One of the best buys in public health<sup>1</sup>

•Low and middle income countries tend to use MC1 & MC2 vaccines while high-income countries use MMR<sup>1</sup>

### WHO Goals

2010, WHO established 3 milestones towards the future eradication of measles - to be achieved by 2015<sup>1</sup>

1 Increase routine coverage with the 1st dose of measles (MCV1) by more than 90% nationally and 80% in each district<sup>1</sup>

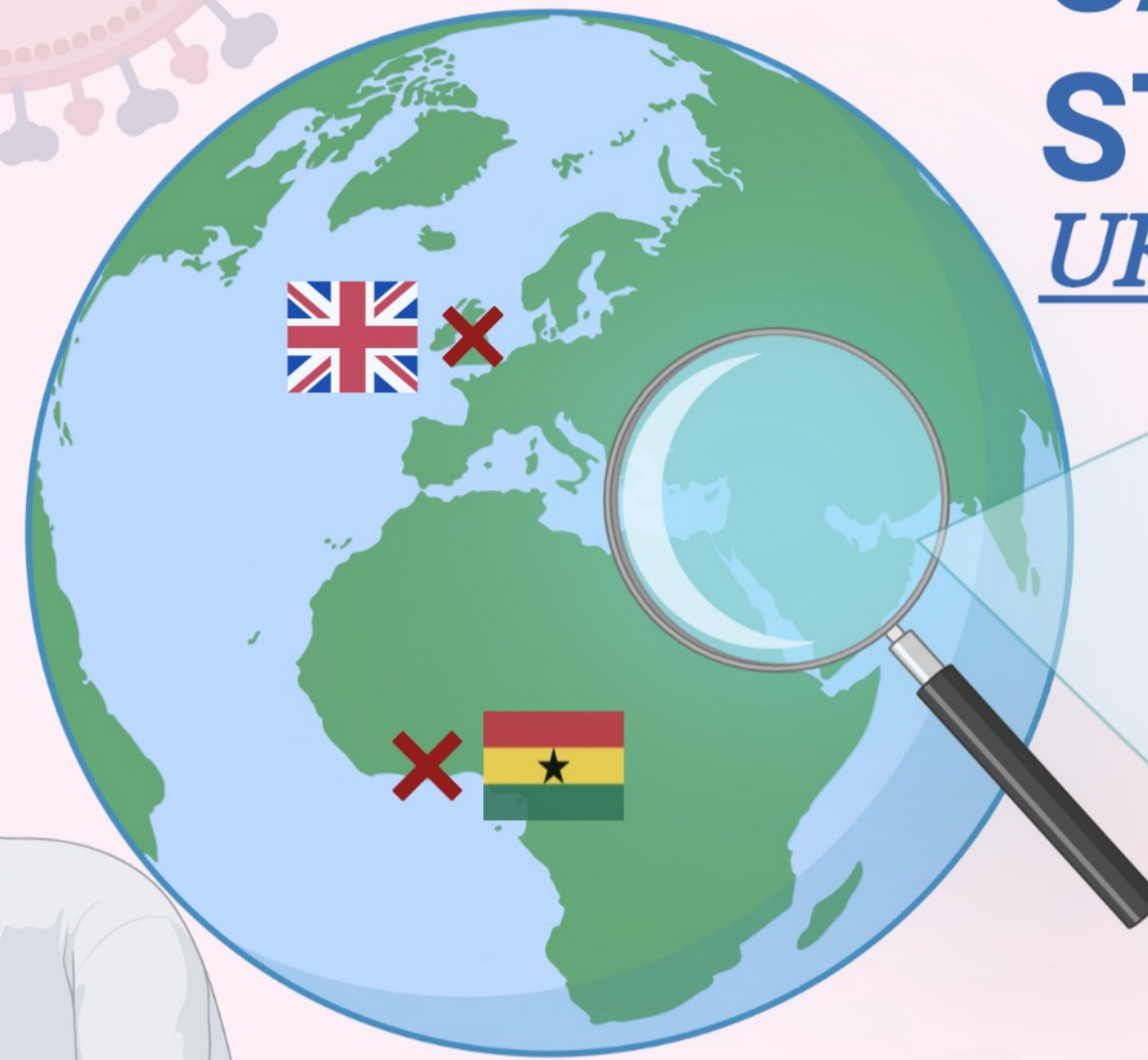
2 Reduce and maintain annual measles incidence to less than 5 cases per million<sup>1</sup>

3 Reduce estimates measles mortality by more than 95% from the 2000 estimate<sup>1</sup>

### METHODS

- WHO, PHE
- Google Scholar
- Search terms: 'Vaccine Hesitancy AND natural remedies', 'Measles AND vaccination AND surveillance', 'Measles AND vaccination AND low income countries', 'Measles AND COVID AND surveillance'

### CASE STUDIES UK vs Ghana



•UK Measles and Rubella elimination strategy<sup>6</sup>

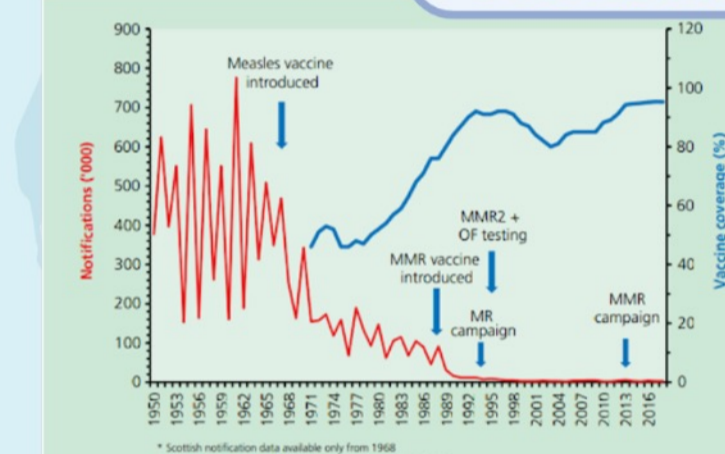
•Green book has recommended vaccination schedules. 1st MMR - given at 12 months, 2nd MMR - given at 3yrs 4 months<sup>7</sup>



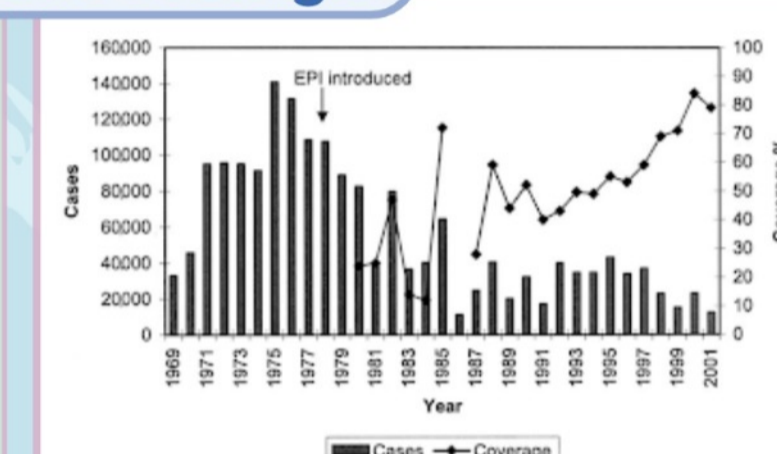
•1979 introduction in select districts as part of the Expanded Program on Immunisation (EPI)<sup>8</sup>

•1991 national introduction of routine vaccination at 9 months<sup>8</sup>

### Vaccination Coverage



Source: Green book, 2019<sup>7</sup>



Source: Bosu et al., 2003<sup>8</sup>

### Surveillance System

**Strengths:**

- Measles is a notifiable disease<sup>6</sup>
- Robust surveillance system
- Early detection
- Timely response
- Available resources

**Challenges:**

- None identified

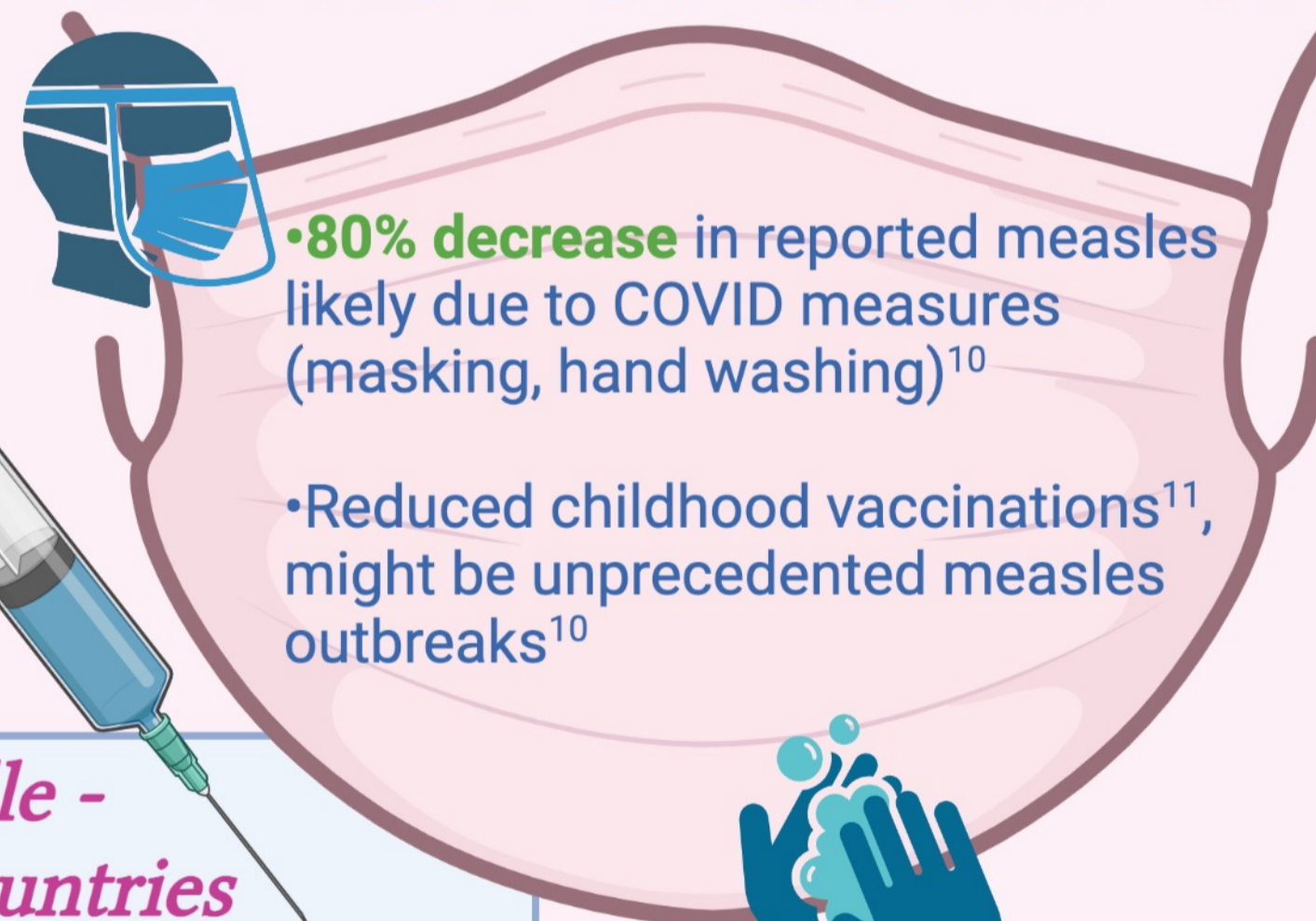
**Strengths:**

- Simple
- Timely
- Stability

**Challenges:**

- Poor data quality<sup>9</sup>
- Microbiology<sup>9</sup>

### IMPACT OF COVID-19



•80% decrease in reported measles likely due to COVID measures (masking, hand washing)<sup>10</sup>

•Reduced childhood vaccinations<sup>11</sup>, might be unprecedented measles outbreaks<sup>10</sup>

### VACCINATIONS Factors

**High - Income countries**

**Natural remedies and no vaccines:**

- Loss of confidence in some vaccines<sup>2</sup>
- Parents who hold natural remedies and healthy lifestyles in high value were found to be vaccine hesitant<sup>3</sup>

**Other determinants of vaccine hesitancy:**

- Cultural differences: Muslim and Jewish communities cannot consume pork<sup>3</sup>
- Use of porcine gelatine free vaccines<sup>3</sup>

**Low/Middle - Income countries**

**Clustering of unvaccinated:**

- Impacted by remoteness, conflict and urban slums<sup>4</sup>

**Variations within districts in countries:** band of districts where coverage was estimated to be below 50% in 2000 and 2019<sup>4</sup>

**Socio-demographic characteristics related to high trust<sup>4</sup>**

- Health system barriers:** inadequate communications about vaccination, unreliability of sessions and high transport costs to reach them<sup>4</sup>

**Limited resources<sup>5</sup>**

### CONCLUSION Recommendations

**High-income countries**

- Remove the practical barriers to vaccination<sup>12</sup>
- Change the way we talk about 'vaccine hesitancy'<sup>12</sup>
- Presenting vaccination as a social norm<sup>12</sup>
- Address the research gap - understand reasons behind vaccine hesitancy<sup>12</sup>

**Low/middle-income countries**

- Ensure the systems can track vaccination with active follow-up.<sup>4</sup>
- Design vaccination services in collaboration with communities.<sup>4</sup>
- Improve data quality<sup>9</sup>
- Plan periodic intensification of routine immunization (PIRI)<sup>4</sup>

### DISCUSSION

- Strengths** ✓
- Compared high income and low-middle income countries which have different factors impacting vaccination due to differences in resource availability and health system designs
  - Able to discover the inequalities in healthcare even with the improvement and progress of modern medicine
- Limitations** ✗
- Difficulty finding data for a lot of LMIC
  - People in conflict zones/rural areas are harder to reach



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<sup>2</sup>Kantner, A.C. et al., 2021. Factors associated with measles vaccination status in children under the age of three years in a post-soviet context: A cross-sectional study using the DHS VII in Armenia - BMC Public Health. BioMed Central. Available at: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-021-10583-5#citeas> [Accessed March 21, 2022].

<sup>3</sup>Stewart, J. & Sayer, L., What factors influence measles ... - magonlinelibrary.com. Mag Library . Available at: <https://www.magonlinelibrary.com/doi/abs/10.12968/chhe.2021.2.3.143> [Accessed March 21, 2022].

<sup>4</sup>Cutts, F.T. et al. (2021) 'Vaccination strategies for measles control and elimination: time to strengthen local initiatives', BMC Medicine, 19(1), p. 2. doi:10.1186/s12916-020-01843-z.

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<sup>6</sup>Public Health England, (2019), National measles guidelines, PHE publications

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<sup>10</sup>Hoffman, M (2021) 'WHO warns of possible measles surge', Jerusalem Post. 4th edn, November. Available at: <https://www.proquest.com/docview/2595846762?pq-origsite=primo> (Accessed: 28 February 2022).

<sup>11</sup>Tanveer, M. et al. (2021) 'The mystery of plummeting cases of measles during COVID-19 pandemic in Pakistan: Hidden impact of collateral damage', Journal of Medical Virology, 93(9), pp. 5236–5238. doi:10.1002/jmv.27045.

<sup>12</sup>The Wellcome Trust. 2022. Effective ways to increase vaccination rates. [online] Available at: <<https://cms.wellcome.org/sites/default/files/2020-12/effective-ways-to-increase-vaccination-rates.pdf>> [Accessed 27 March 2022].

## CONTRIBUTOR STATEMENTS:

**Isabella Carreon:** Researched vaccination factors that contribute to re-emergence of measles in high income countries, strengths and limitations of our findings, and co-presenter along with Jonta.

**Lydia Egdudin:** Researched the re-emergence of measles in the UK, including national policies, vaccine coverage/vaccine schedule and surveillance systems.

**Jonta Kamara:** Researched WHO goals, vaccination factors that contribute to re-emergence of measles in low/middle income countries, the impact of covid on re-emergence of measles, how to strengthen surveillance systems in low/middle income countries, strengths and limitations of our findings, and co-presenter along with Isabella.

**Zaib Mattara:** Researched epidemiology of measles. Collated the group's research findings/points, designed and produced the poster, including the graphics. Made reference sheet.

**Yusra Omidiran:** Researched the re-emergence of measles in Ghana, including national policies, vaccine coverage/vaccine schedule and surveillance systems, recommendations for high income countries to counteract vaccine hesitancy and reduce re-emergence of measles.



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