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Setting a Target for Maternal Mortality

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Outline of talk

- What is the MMR—definition and data issues
- Assessing plausible targets for MM reduction
- Historical trends in MMR
- Absolute target for MMR
- Proportional reduction target for MMR
- Conclusions and questions



U5MR versus MMR

- U5MR is an age specific rate whereas the MMR is a cause specific ratio.
- The Under 5 Mortality Rate is the number of children under 5 who died per 1,000 live births. The other under-five mortality rates are also on that scale.
- The MMR is a ratio of maternal deaths per 100,000 live births –note the extra factor of 100 in the denominator.



- MMR is expressed as the number of maternal deaths per 100,000 live births.

Consider an MMR of 325 versus an MMR of 271: If we express per 1,000 live births, the result is 3.25 versus 2.71. These MMRs are quite similar—both would round to 3 deaths per 1,000 Live births.

- Thus, the MMR is a measure that gives a false sense of precision.
 - Typically cannot disaggregate the MMR for subnational values
 - Even national level estimates of the MMR have a wide range of uncertainty



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MMR Numerator: maternal deaths

*The death of a woman **while pregnant or within 42 days of termination of pregnancy**, irrespective of the duration and site of the pregnancy, **from any cause related to or aggravated by the pregnancy or its management** but not from accidental or incidental causes.*

Need to know:

- Pregnancy status of the woman
- Timing of death
- Medical cause of death

WHO International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, 1992 (ICD-10)



Maternal mortality is difficult to measure

- Need to have information on pregnancy status, timing and cause
- Rare event

Available data suffer from serious limitations

- Sparse
- Suffer from under-reporting and misclassification of deaths
- May have definitional differences

The settings with highest maternal mortality tend to be also the settings with the greatest data quality problems



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Assessing plausible targets for MM reduction

- **Absolute level of MMR by a specific year**
 - MMR of 50
 - Target year: 2035
- **Proportional reduction or annual rate of reduction (ARR) by a specific year**
 - 75% decline by 2035 (ARR=5.5%)
 - 85% decline by 2035 (ARR=7.3%)



Target should be ambitious but plausible; should accelerate progress

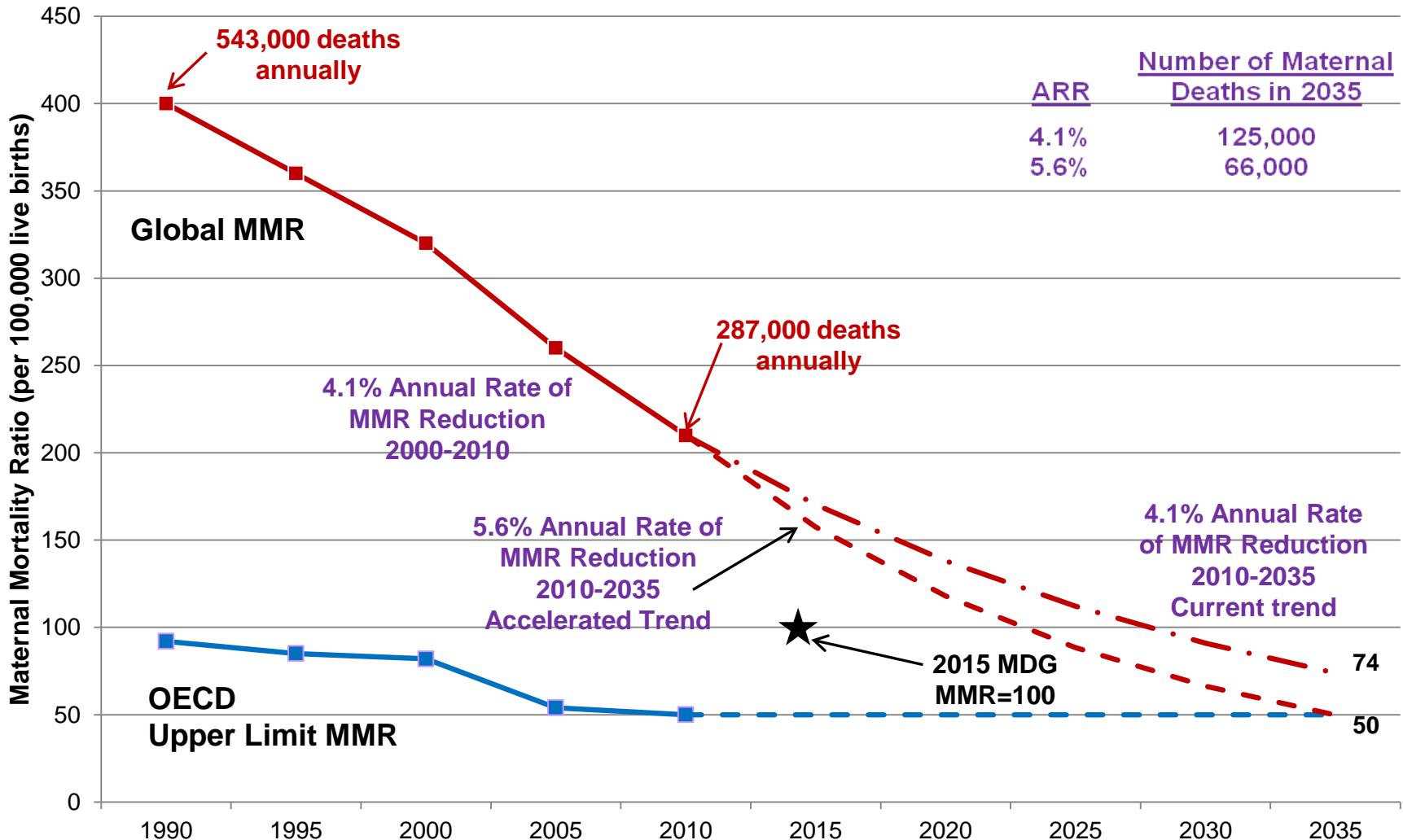
Four key components to the specification of a target:

- **Indicator: MMR** (MDG 5: MMR)
- **End year: Focus here on 2035, but actual value is TBD**
(MDG 5: 1990-2015)
- **Trajectory: Annual Rate of Reduction (ARR) does not have to be constant, but the average value should be feasible**
(MDG 5: ARR of 5.5%)
- **End value: Determined by the choice of end year and ARR, with rounding** (MDG 5: 25% of the start value, or a decline of 75%)



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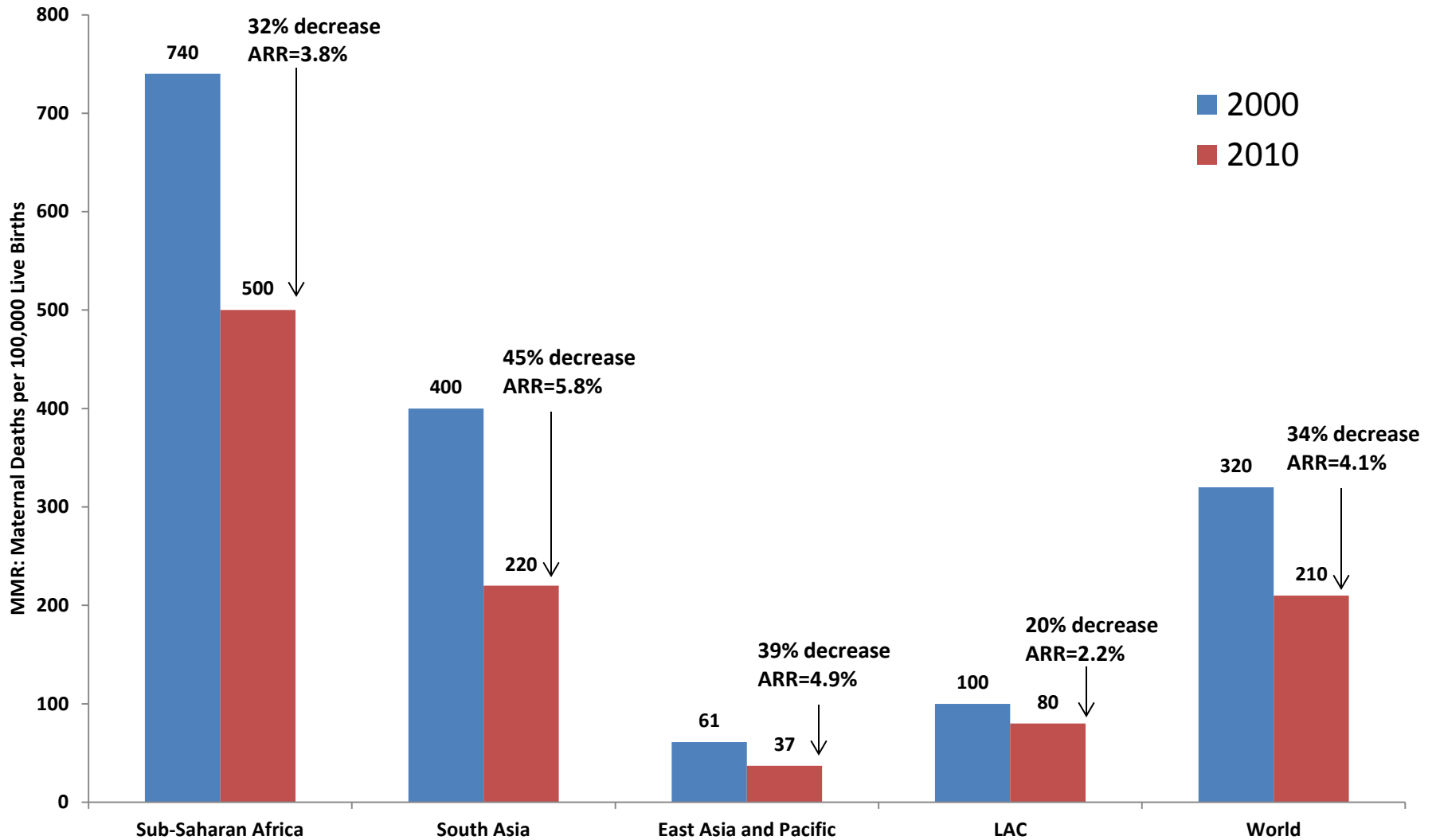
Ending preventable maternal deaths worldwide by 2035-reaching MMR = 50



Source: UN Estimates for Trends in Maternal Mortality 1990-2010. World Health Organization, 2012.



Maternal mortality declined globally between 2000 and 2010, but with considerable regional variation

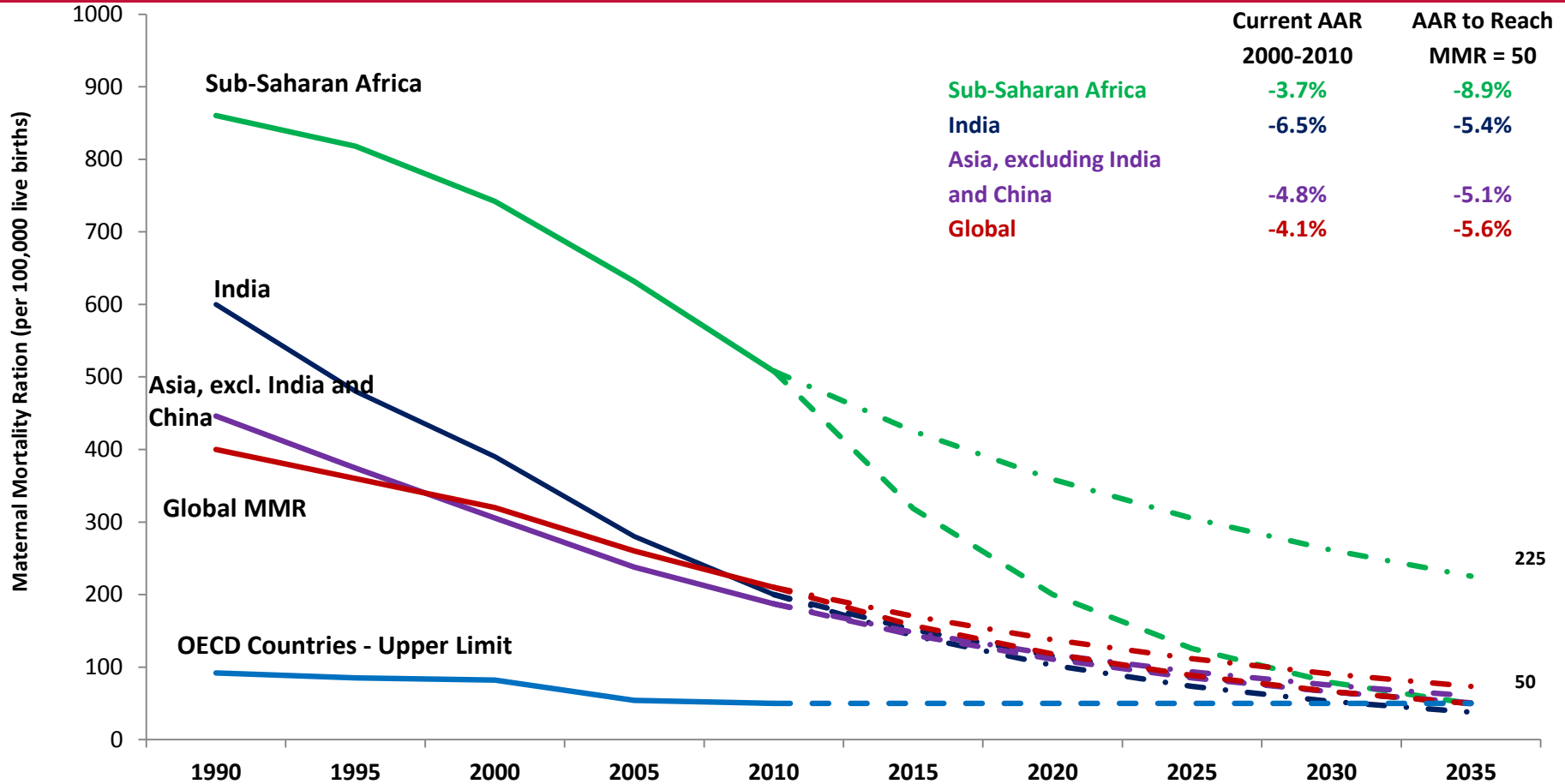


Source: UN Estimates for Trends in Maternal Mortality 1990-2010. World Health Organization, 2012.



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Countries require different rates of reduction to end preventable maternal deaths by 2035 – reaching MMR = 50



Asia: Afghanistan, Bhutan, Cambodia, Indonesia, Iran, Iraq, Kyrgyzstan, Lao, Morocco, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Solomon Islands, Tajikistan, Turkmenistan, Uzbekistan, VietNam, Yemen

Africa: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Togo, Uganda, Tanzania, Zambia, Zimbabwe



Select a plausible end value of the MMRatio, AFTER the end year has been selected.

- **MMR:** The estimated global MMRatio for 2010 was 210.
- **ARR:**
 - The estimated global ARR for 2000-2010 was 4.1%.
 - Acceleration would mean a target ARR > 4.1%, although not necessarily > 5.5% (the MDG5 value). **Plausible range could be 5% to 7%.**
 - In 2000-2010, only **22 countries** had an ARR more than 5.5% - **required ARR to meet MDG 5 (75% reduction from 1990 to 2015)**; Only **20 countries** had an ARR more than **6%** from 2000-2010; among them, only **5 countries** had an ARR more than **8%**¹
- Use Table to guide choice of ARR and target value of the MMRatio, for a specified time year.

¹ Wardlaw T, You D. Plausible Scenarios for Ending Preventable Maternal Deaths. UNICEF, 2012.



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Future global MMRatio implied by MMRatio=210 in 2010 and ARR between 5% and 7%

Values of ARR	End Years				
	2015	2020	2025	2030	2035
5.00	164	127	99	77	60
5.25	162	124	96	73	57
5.50	160	121	92	70	53
5.75	158	118	89	66	50
6.00	156	115	85	63	47
6.25	154	112	82	60	44
6.50	152	110	79	57	41
6.75	150	107	76	54	39
7.00	148	104	73	52	36



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Implied choice of target MMRatio

Global target MMRatio for each possible end year:

2020: 120 (This end year seems too soon)

2025: 80? 90?

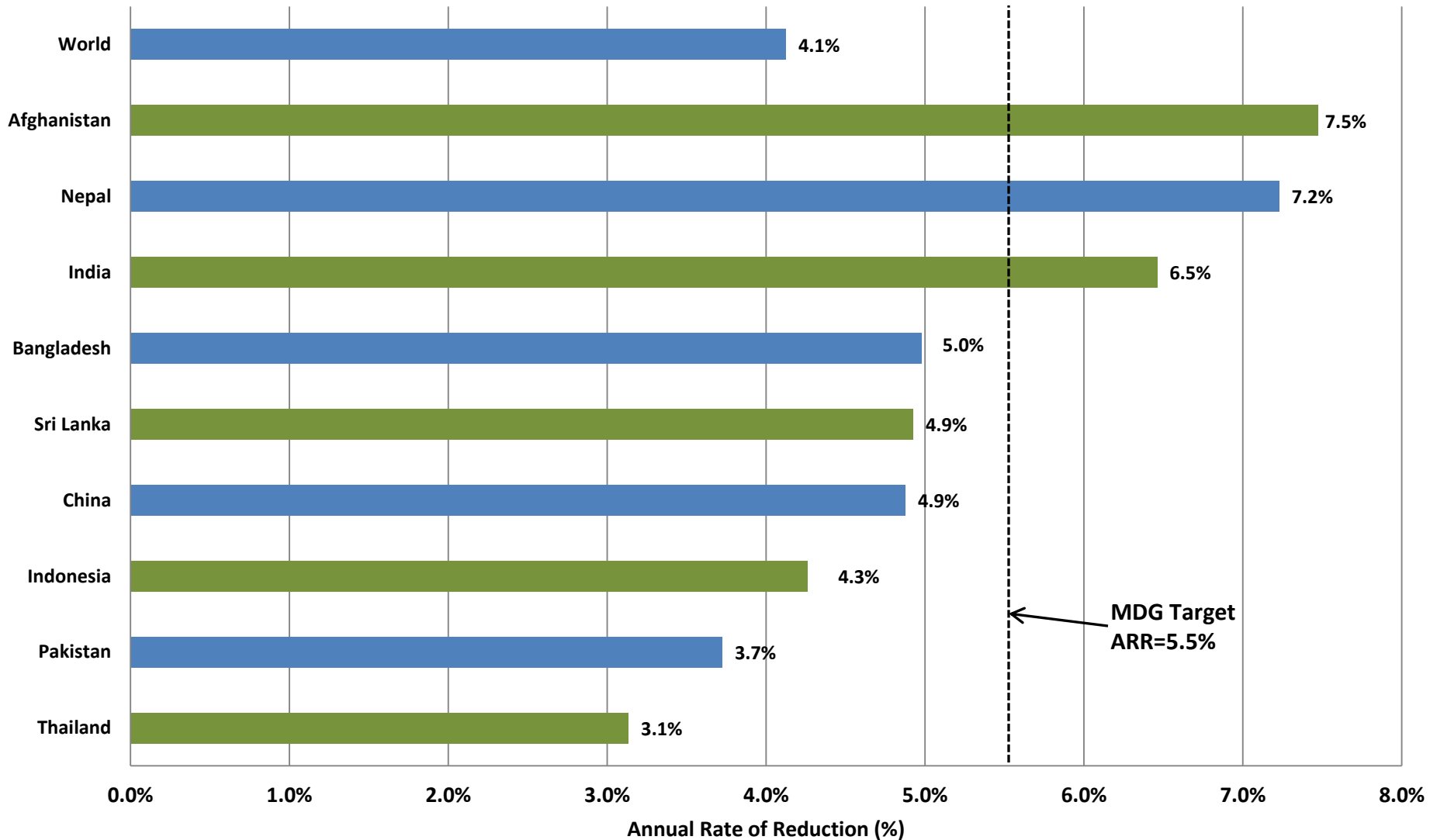
2030: 60

2035: 50

These end values appear plausible and are rounded numbers.



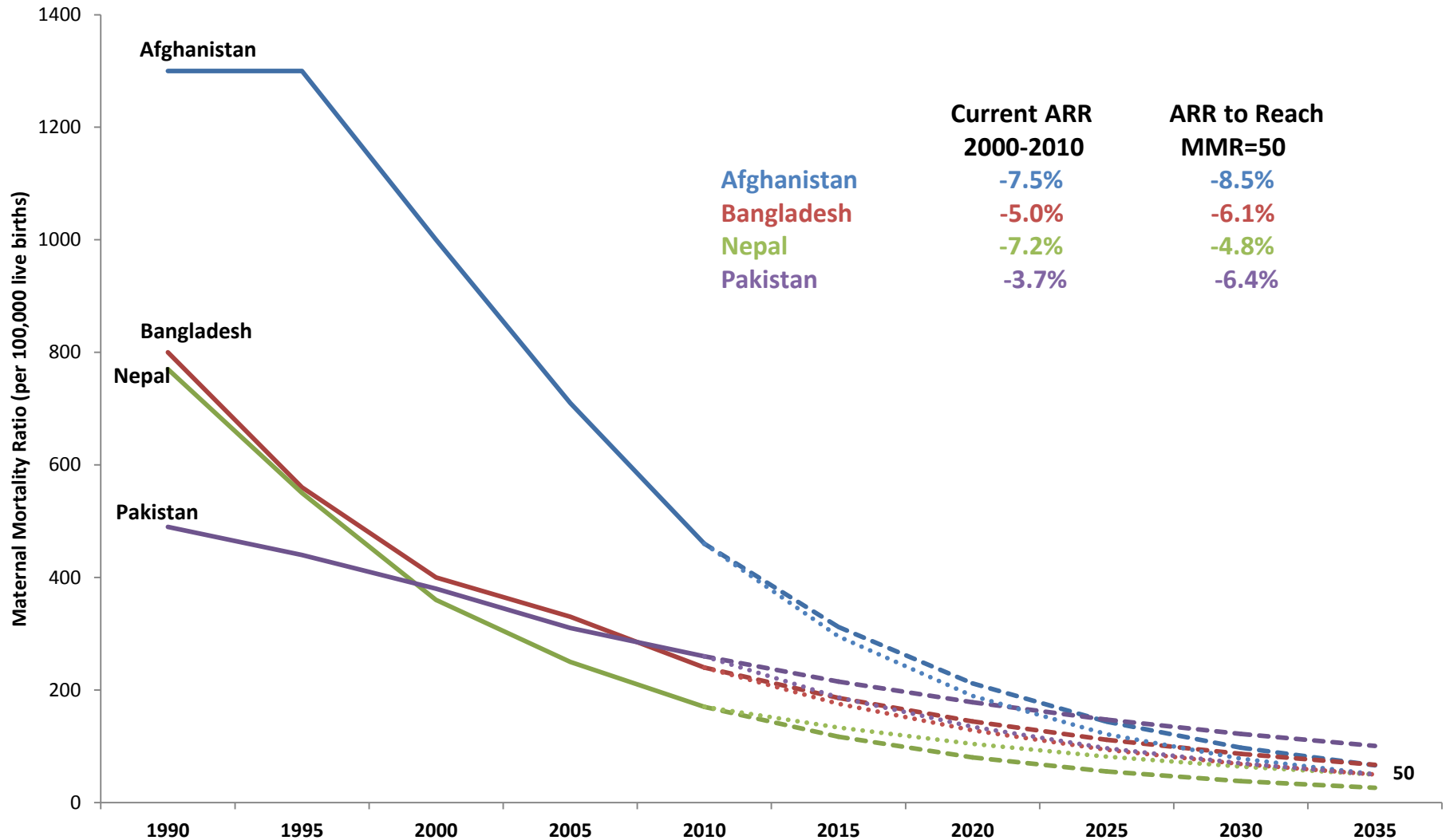
Maternal Mortality Ratio Average ARR (%), 2000-2010





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ARR for Afghanistan, Bangladesh, Nepal and Pakistan, to reach MMR = 50, 2035

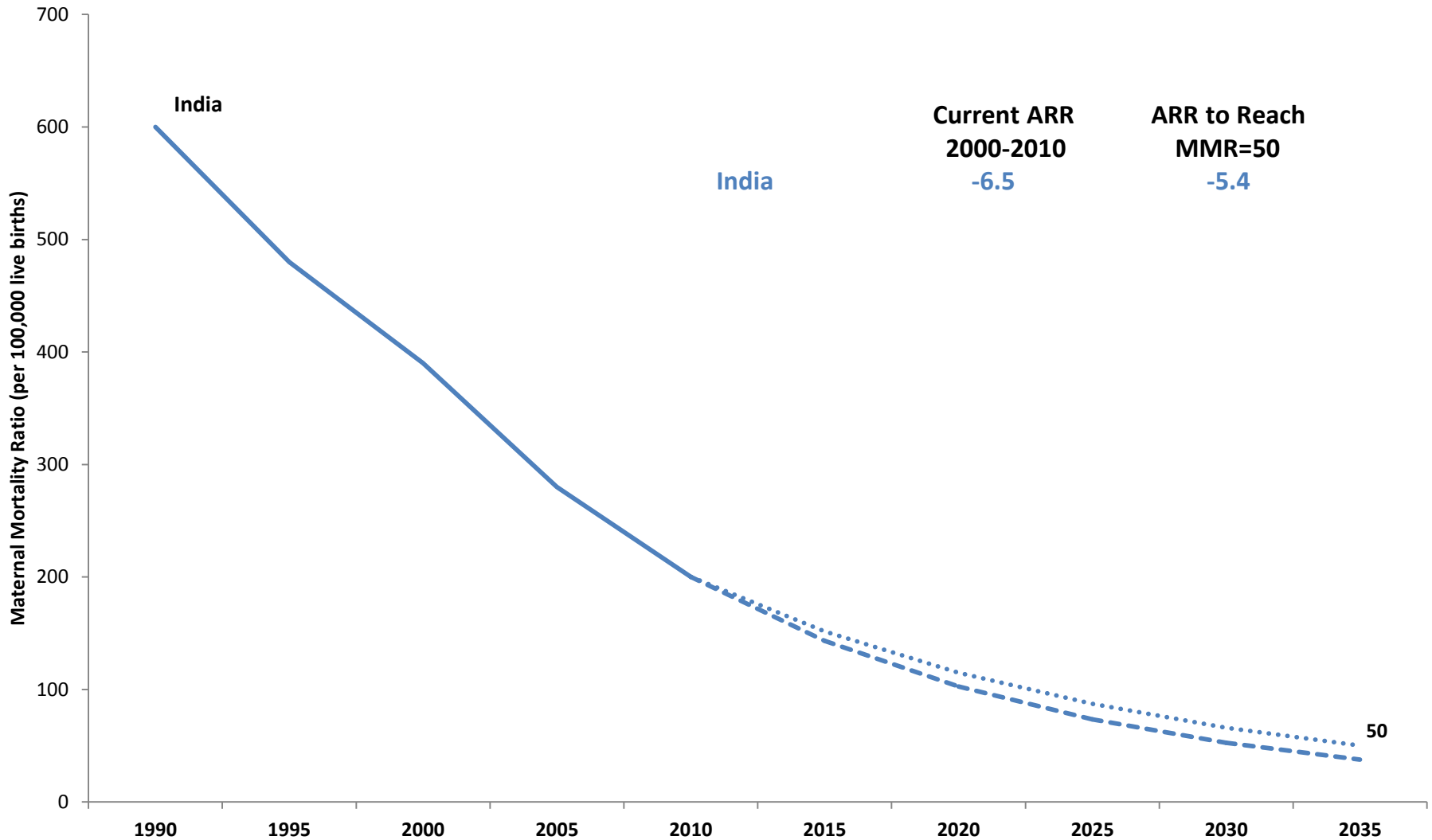


Source: UN Estimates for Trends in Maternal Mortality 1990-2010. World Health Organization, 2012.



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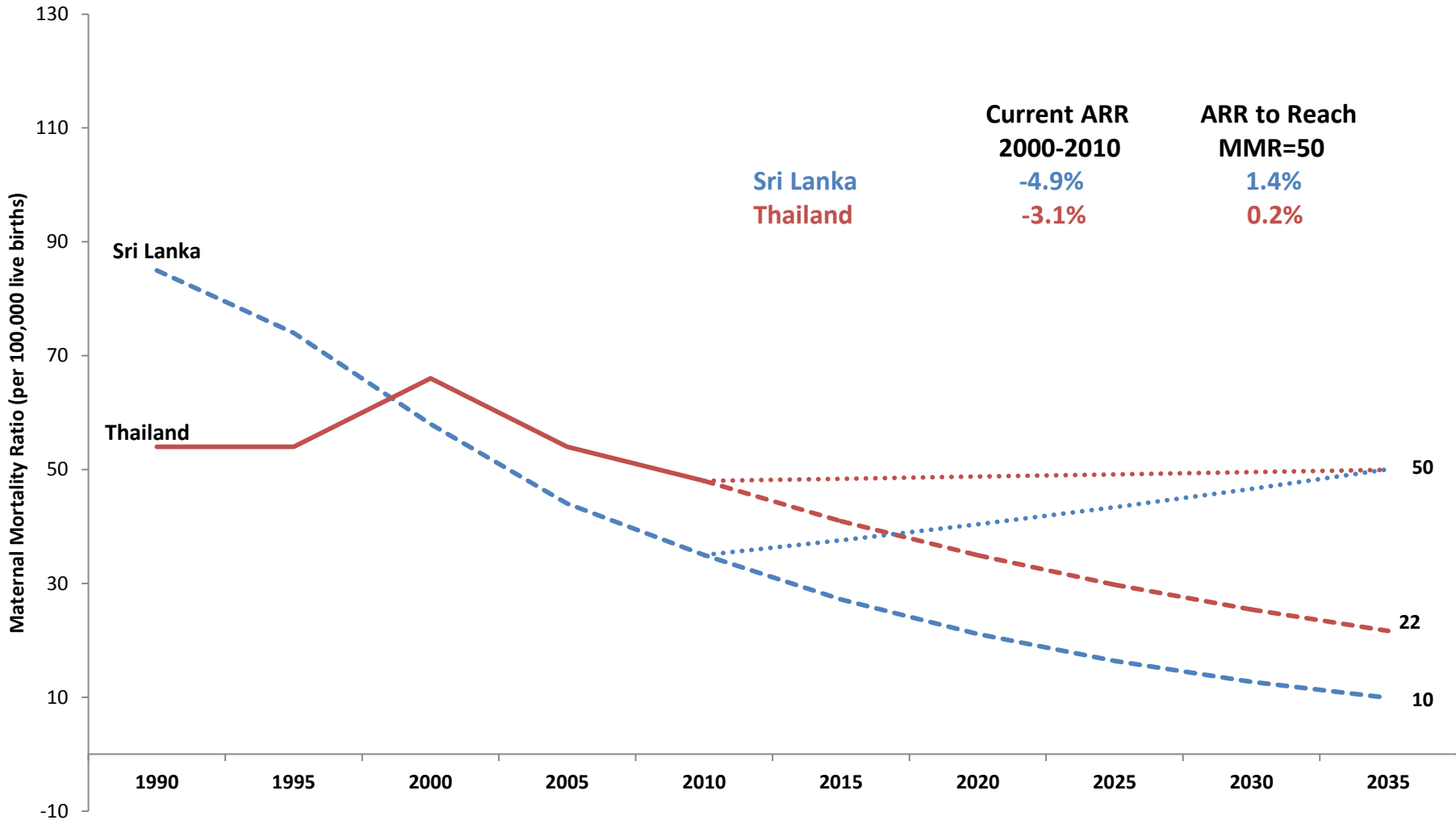
ARR for India to reach MMR 50, 2035





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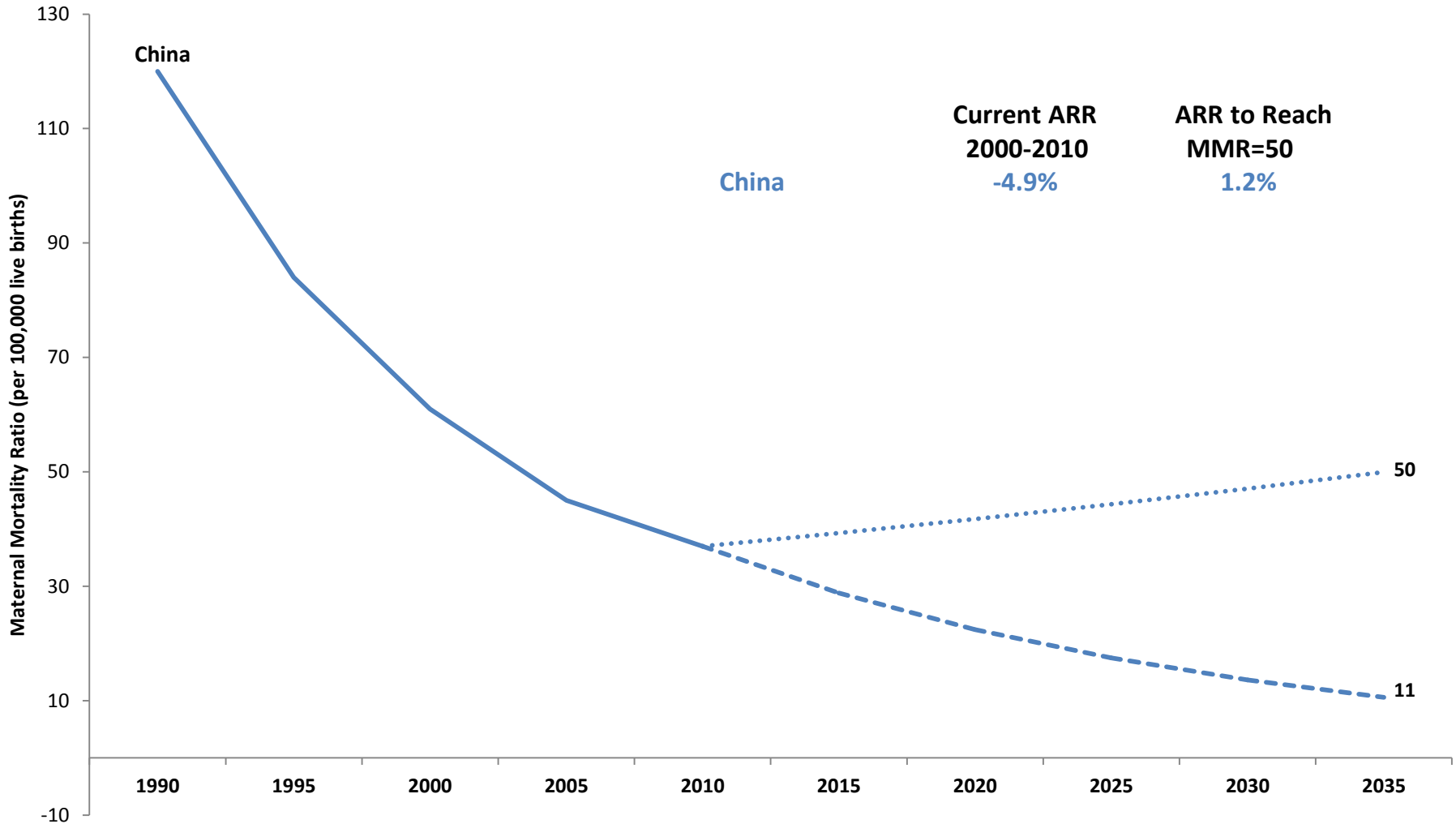
ARR for Sri Lanka and Thailand to reach MMR 50, 2035





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ARR for China to reach MMR 50, 2035





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Future level of MMRatio implied by MMRatio=400 in 2010 and specified ARR between 5% and 7%

Values of ARR	End Years				
	2015	2020	2025	2030	2035
5.00	310	239	185	143	111
5.25	305	233	178	136	104
5.50	301	227	171	129	97
5.75	297	221	165	122	91
6.00	294	215	158	116	85
6.25	290	210	152	110	80
6.50	286	204	146	104	75
6.75	282	199	140	99	70
7.00	278	194	135	94	65



A *GLOBAL MMR target* of 50 by 2035 is plausible, but no single target value for all countries would be desirable.

-- Countries >400MMR (2010): A target of 50 by 2035 cannot be applied to the highest fertility countries; the required rate of reduction would be out of reach.

-- Many Asian countries (e.g., Nepal, Bangladesh, Pakistan and Indonesia), could follow the trajectory for the global MMR of 50 by 2035

-- Trajectories for Thailand, Sri Lanka, India, and China show that a target of 50 by 2035 would not make sense as they are already close to that level.

The goal for such countries could be *within-country equity for MMR across subnational populations.*



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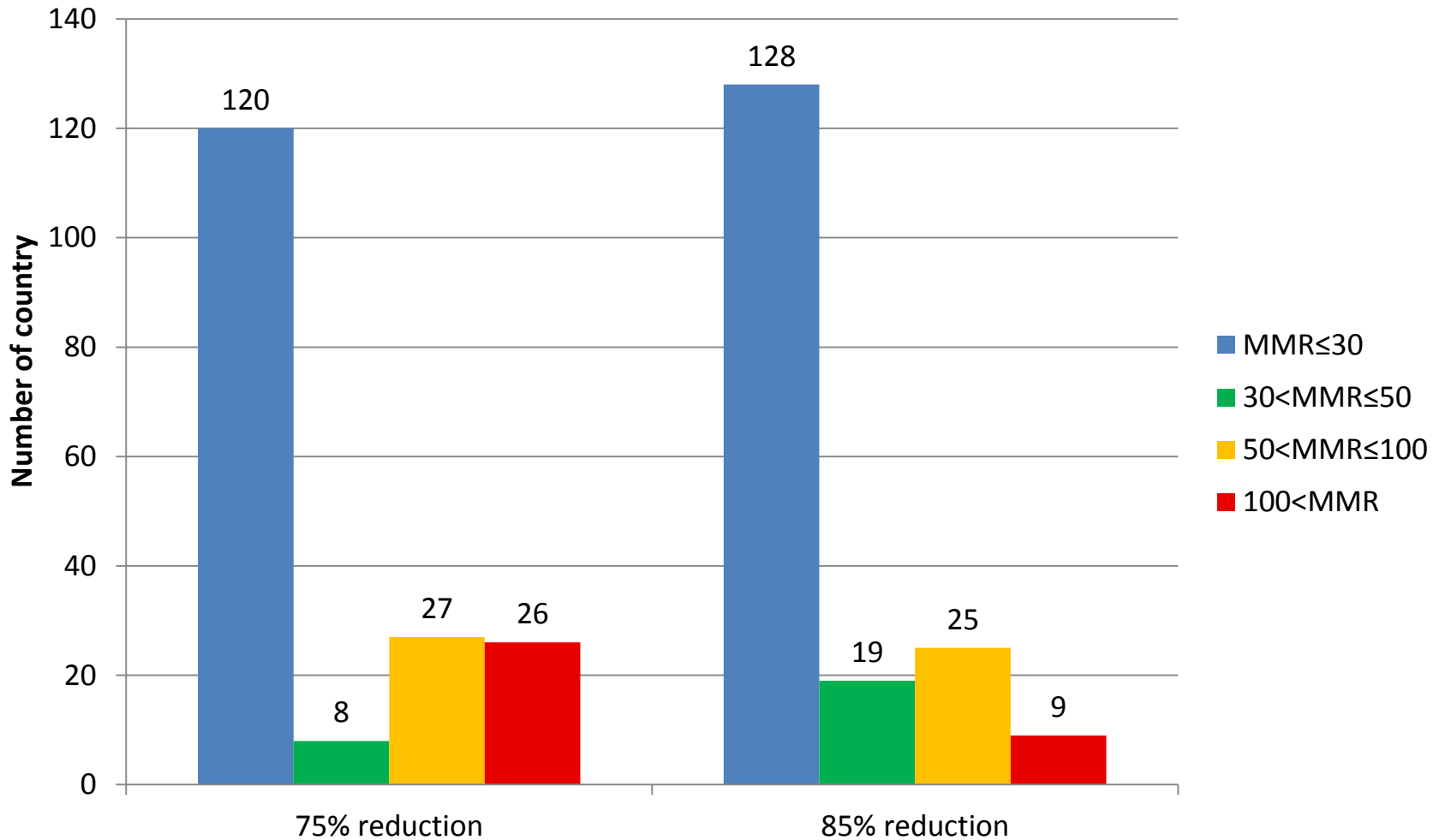
Proportional decline targets





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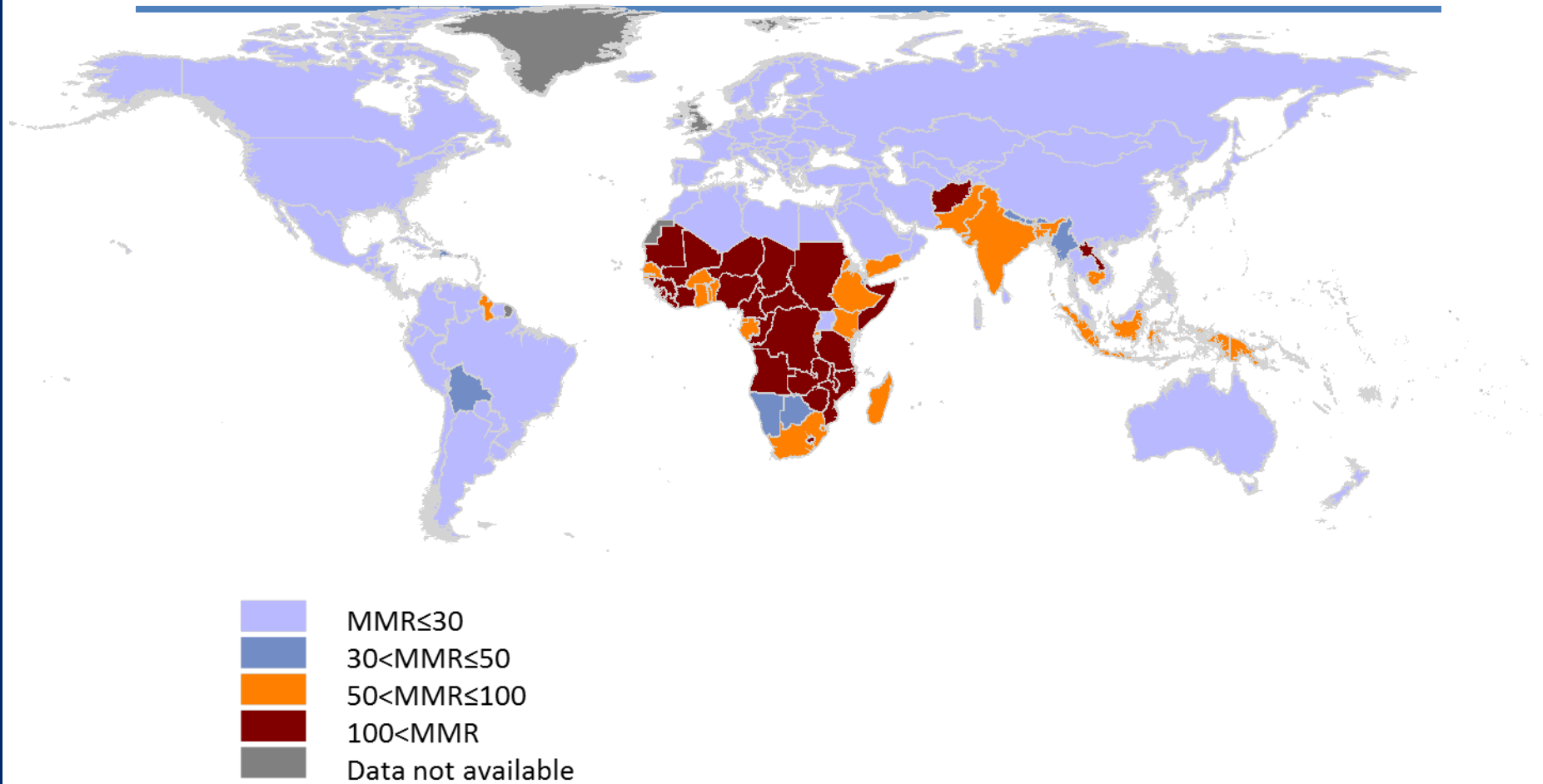
Number of countries with specific ranges of MMR by 2035 under different proportional decline scenarios





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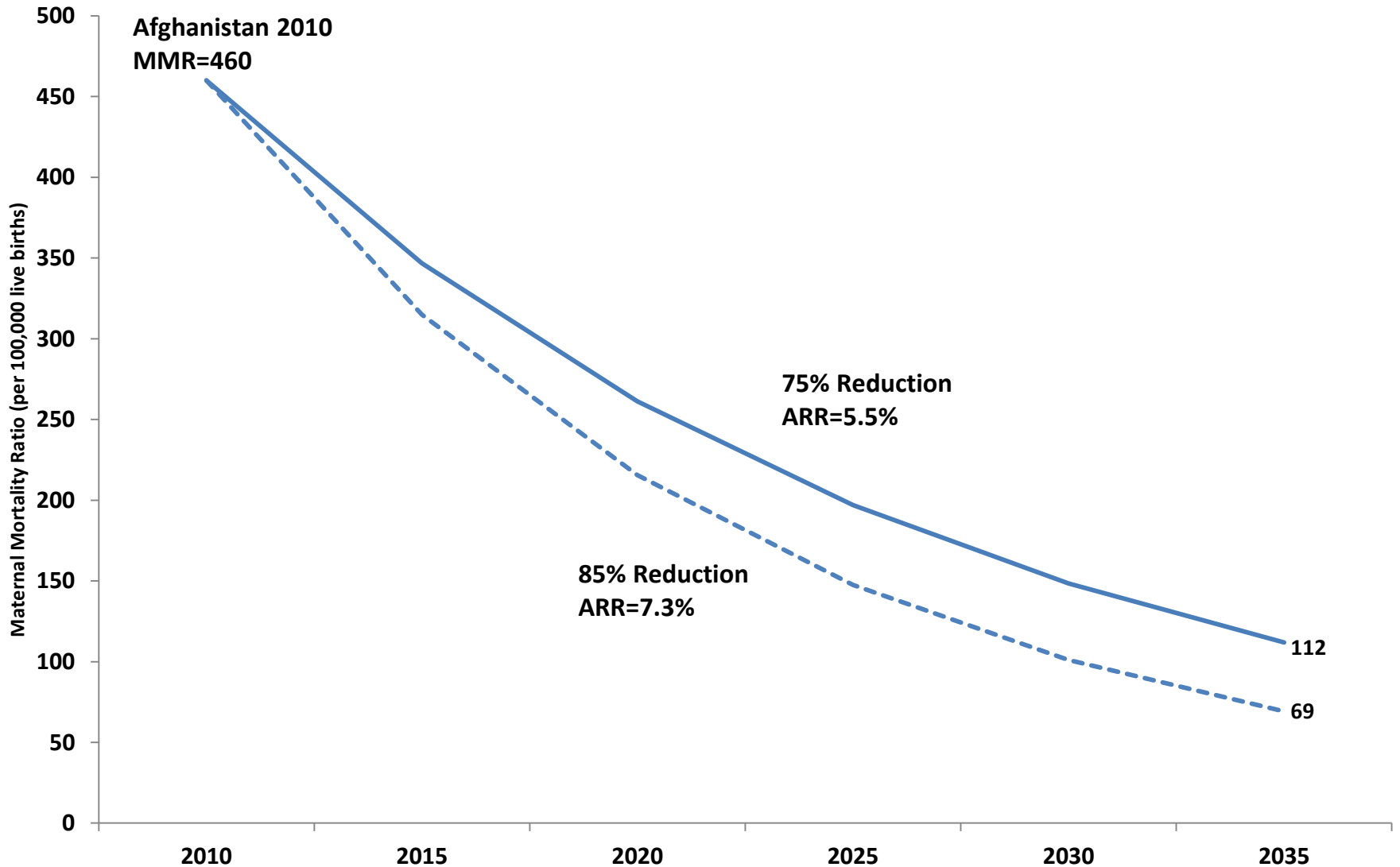
MMR in 2035 – 75% reduction by 2035





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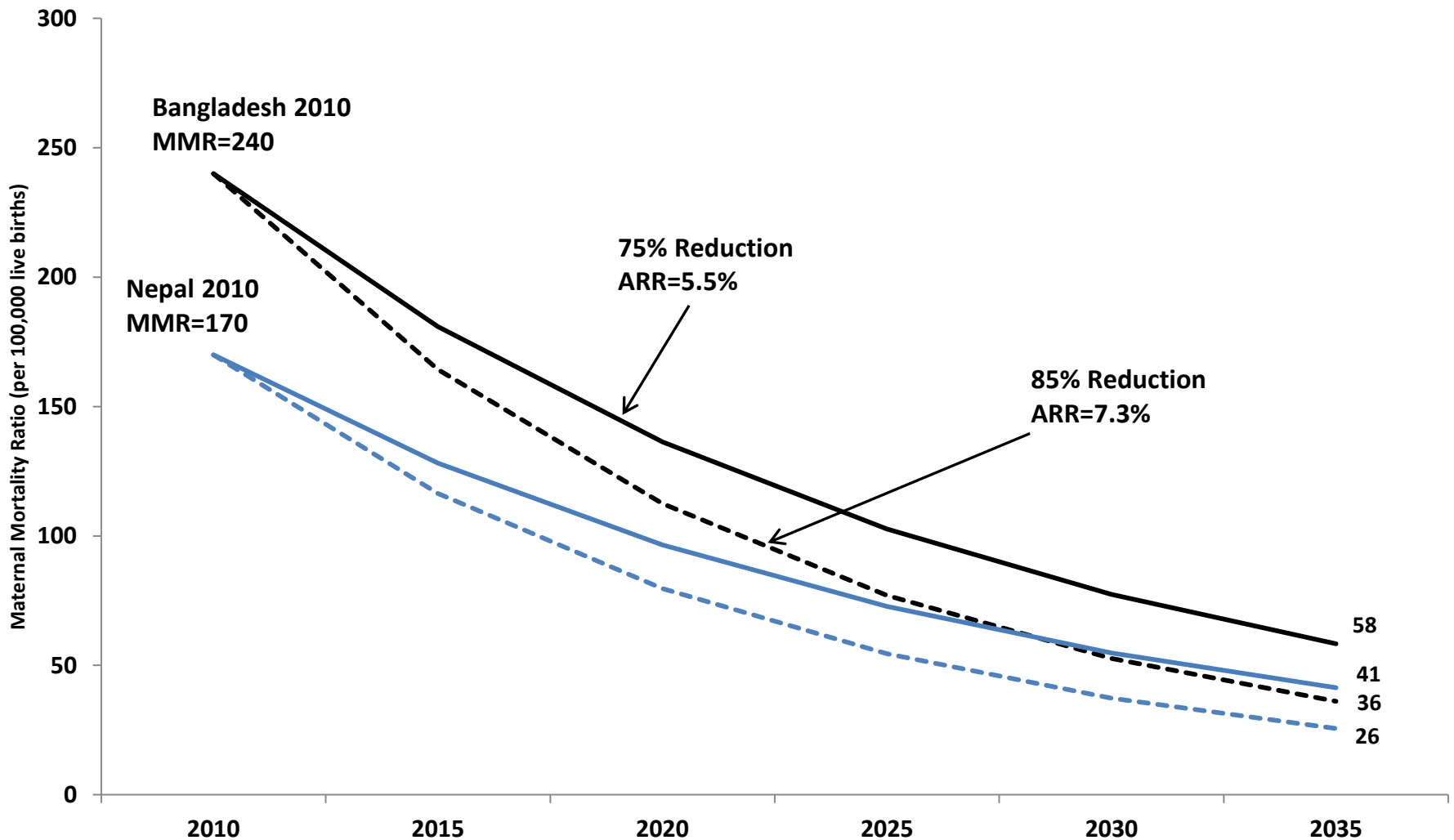
Afghanistan: MMR in 2035 with 75% and 85% reductions from 2010



Source: UN Estimates for Trends in Maternal Mortality 1990-2010. World Health Organization, 2012.



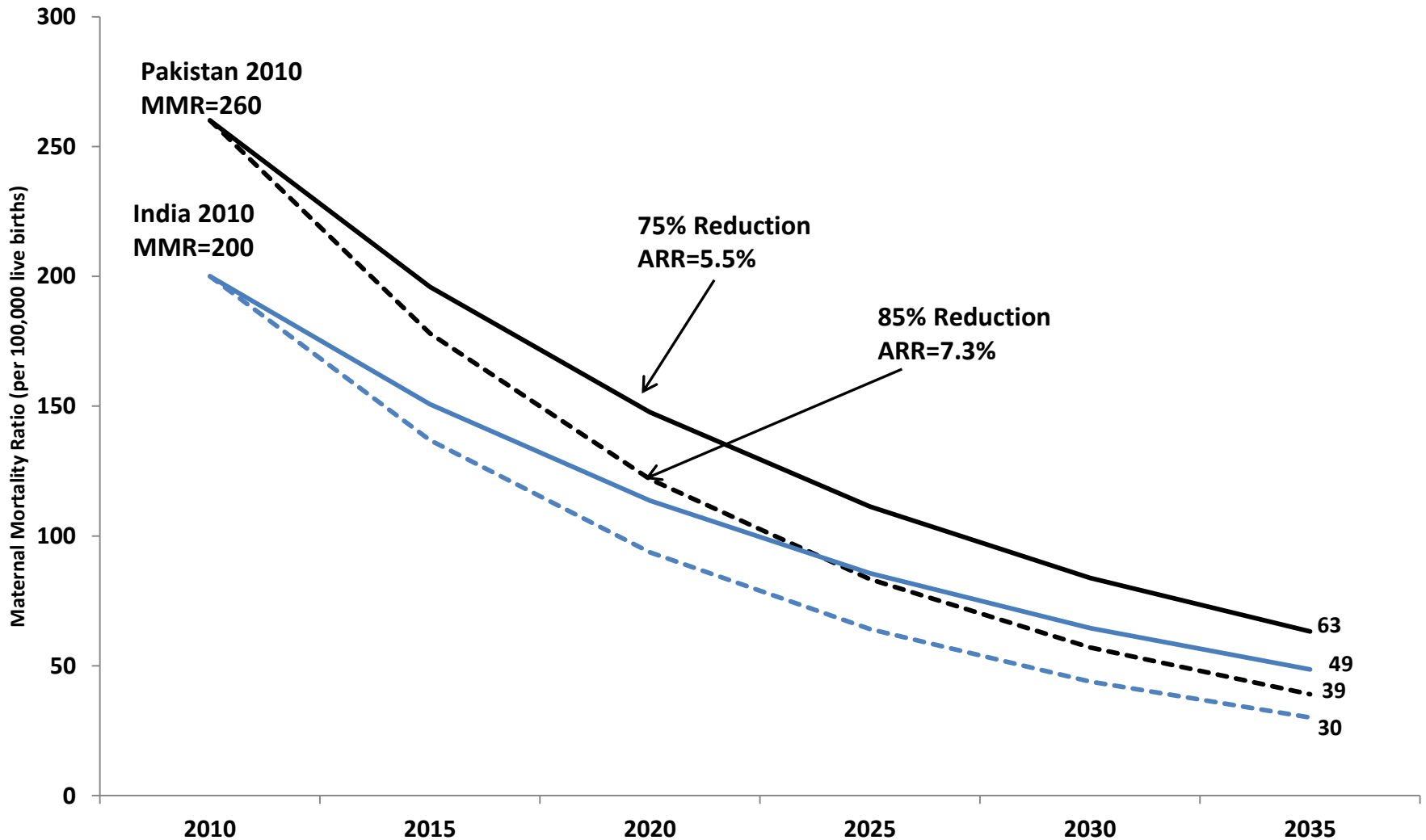
Bangladesh, Nepal: MMR in 2035 with 75% and 85% reductions from 2010





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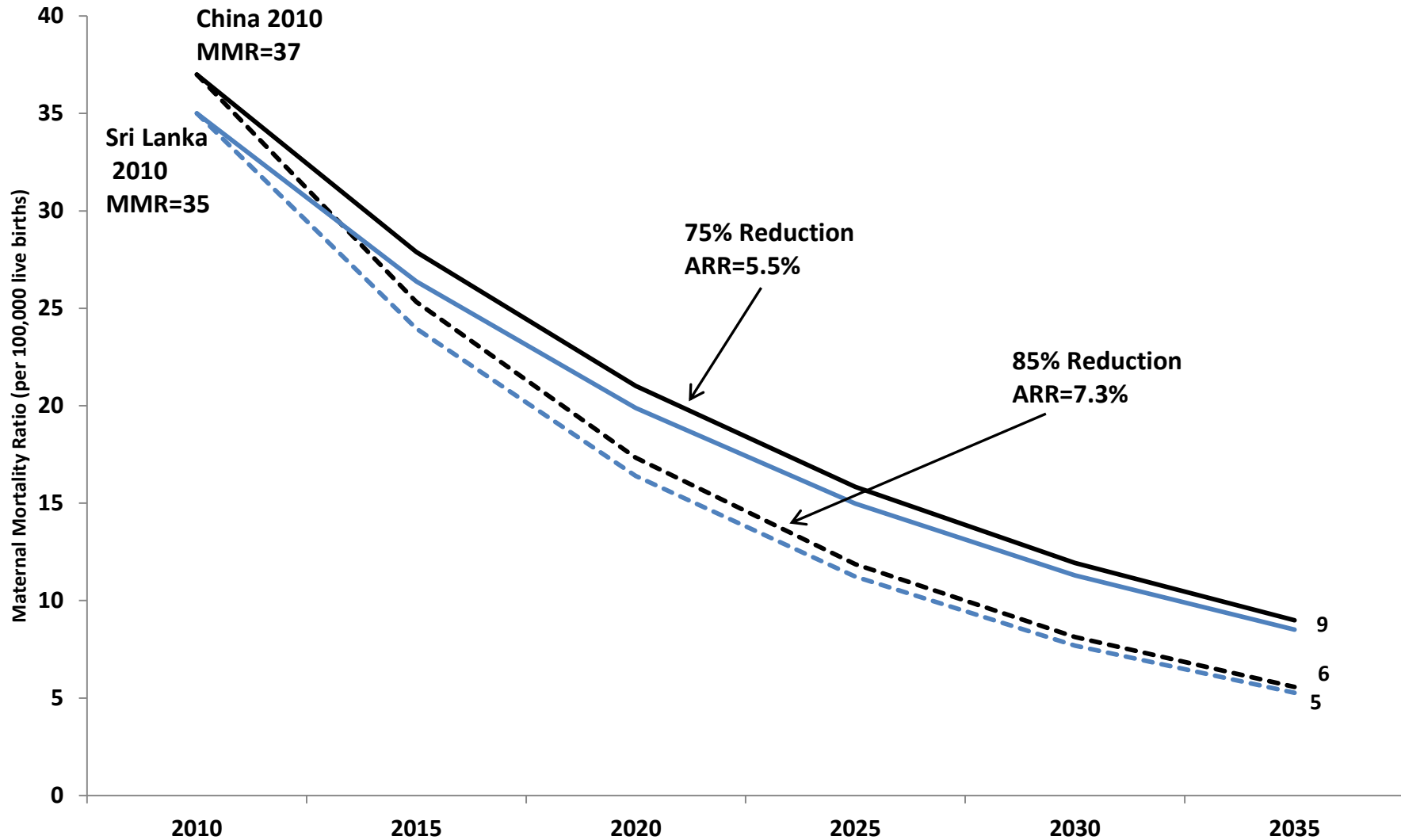
Pakistan, India: MMR in 2035 with 75% and 85% reductions from 2010





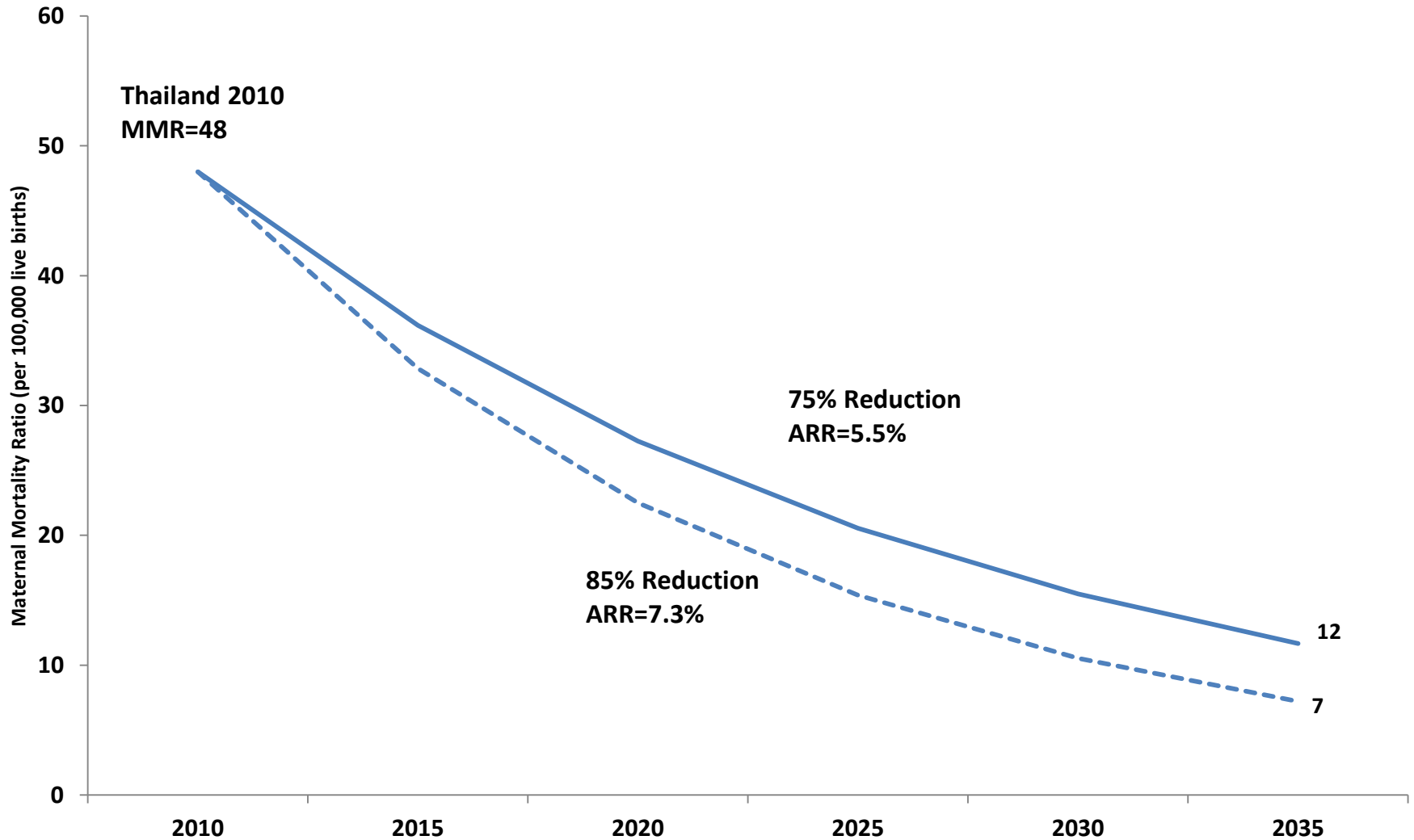
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China, Sri Lanka: MMRs in 2035 with 75% and 85% reductions from 2010





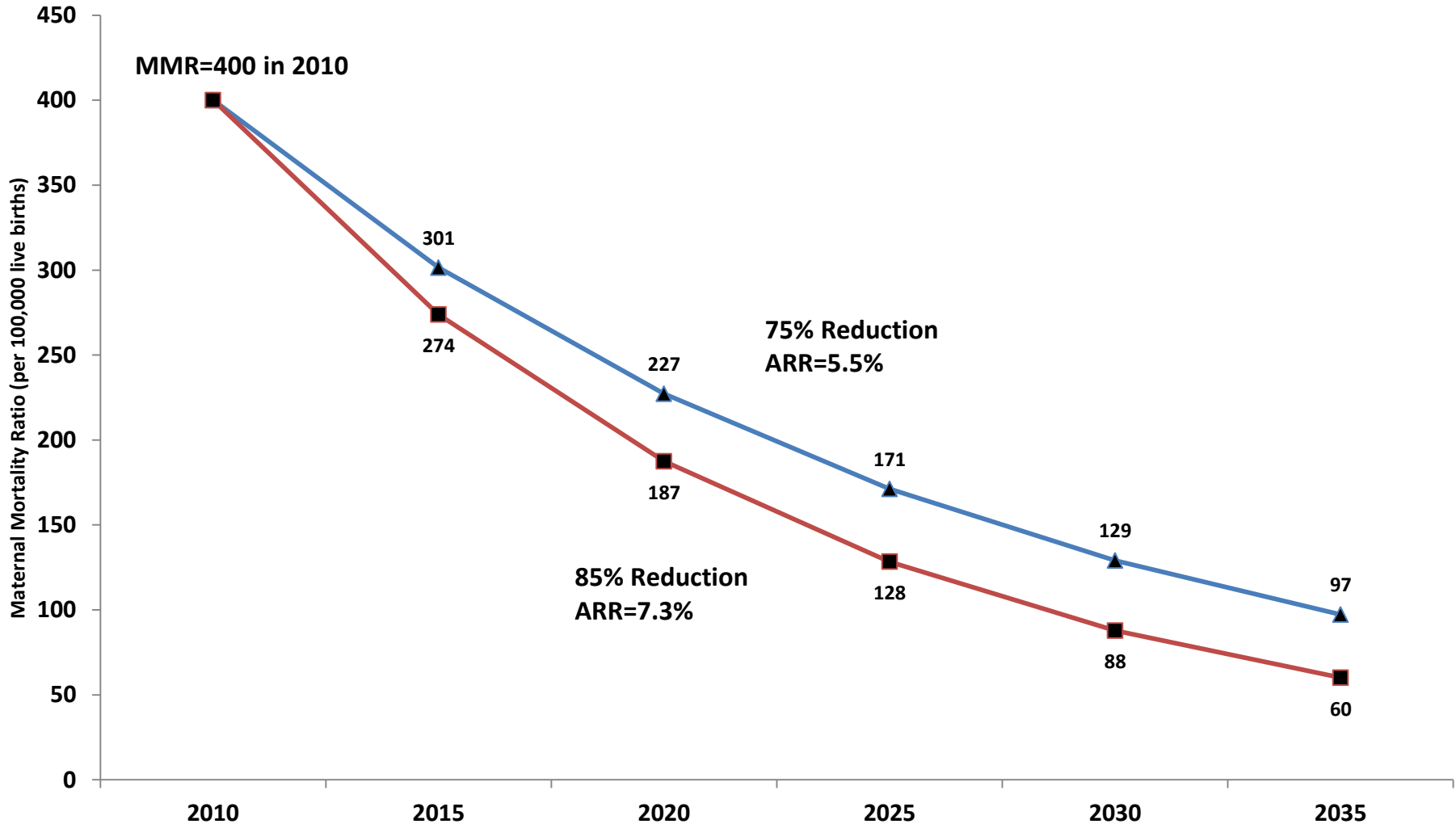
Thailand: MMR in 2035 with 75% and 85% reductions from 2010





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A country with MMR=400 in 2010 will need to maintain high ARR to meet MMR=100 by 2035





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Key points and questions

- **Target indicator** : should it be MMR?

A target with one absolute level (e.g. 50/100,000 by 2035) makes it more difficult to achieve for countries with high MMRs, particularly Sub-Saharan African countries

Should the target indicator thus be a GLOBAL indicator?

- **The end year**: 2030, 2035—will depend on the development agenda



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Key points and questions

End Year, Global target MMRatio and percentage decline (from 2010)

- End year = 2025:
Global MMR target= 80 or 90; percent decline=60%
- End year = 2030:
Global target= 60; percent decline=70%
- End year = 2035:
Global target= 50; percent decline=80%



- **ARR -- trajectory:**

- Each country could be located or placed on a trajectory of decline implied by a global target
- Each country's rate of progress could be measured by passing 5 year milestones consistent with its position on the trajectory
- Countries at very high MMR levels could aim for higher MMR than global MMR (eg., MMR=100)
- Countries at low levels could focus on remaining high MMR sub-populations/within country equity.