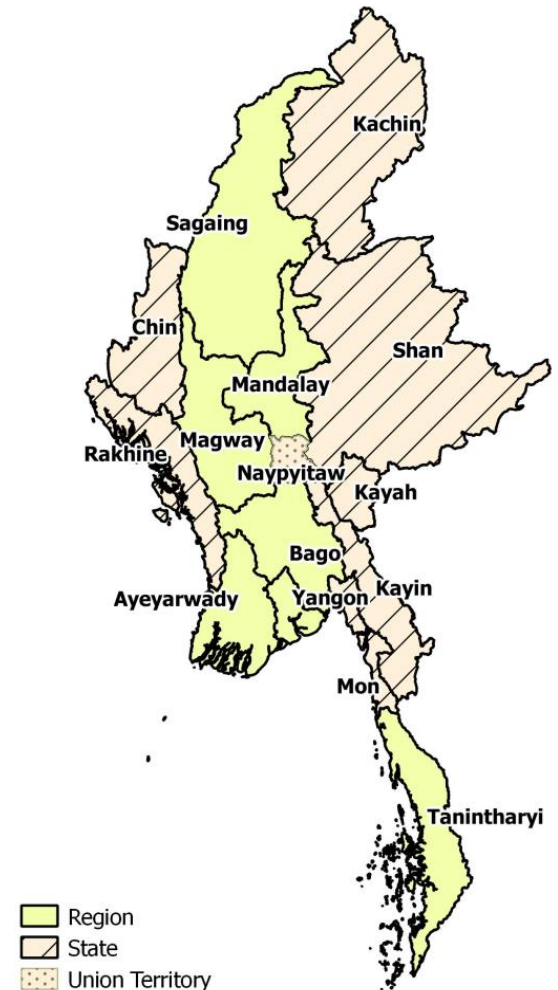


Myanmar – Education Policy Scenario

- Population of 50.3 million (2014)
- 7 States, 7 Regions + 1 Union Territory
- Each state divided into districts then townships
- 330 townships



Myanmar – Education Policy Scenario

Key Facts:

- Data collated by the Myanmar Information Management Unit (MIMU)
- Includes information on location, year and the source of the data
- Data available at the national (union), state and region and township level
- Locations indicated by name and “Pcode” which is a unique ‘place code’ useful for geographic mapping (and joining)

Myanmar – Education Policy Scenario

Education and poverty were central issues in the last election. With voters being particularly concerned about the limited progress that has been made to increase access to education for some of the most disadvantaged communities. Reflecting these concerns, the Minister has asked for your advice on where investments might best be made to address the issue, asking:

- Which State or Region has seen the strongest growth in the number of primary teachers and primary schools since 2009? How does this relate to wealth?*
- Using the 2015 Wealth Ranking Index and the maternal mortality ratio, which townships appear most vulnerable?*
- Is there a relationship between educational attainment, wealth, maternal mortality and urbanization?*
- The Minister has proposed implementing a policy to boost primary enrolment in the most vulnerable rural communities by paying a stipend of 26 USD for all females enrolled in education (between the ages of 5 and 29).*
 - How much is this likely to cost per year?*
 - Which ten townships are likely to benefit the most from this (in \$ terms)?*
 - What if this was restricted only to rural and ‘vulnerable’ communities?*

Myanmar – Education Policy Scenario

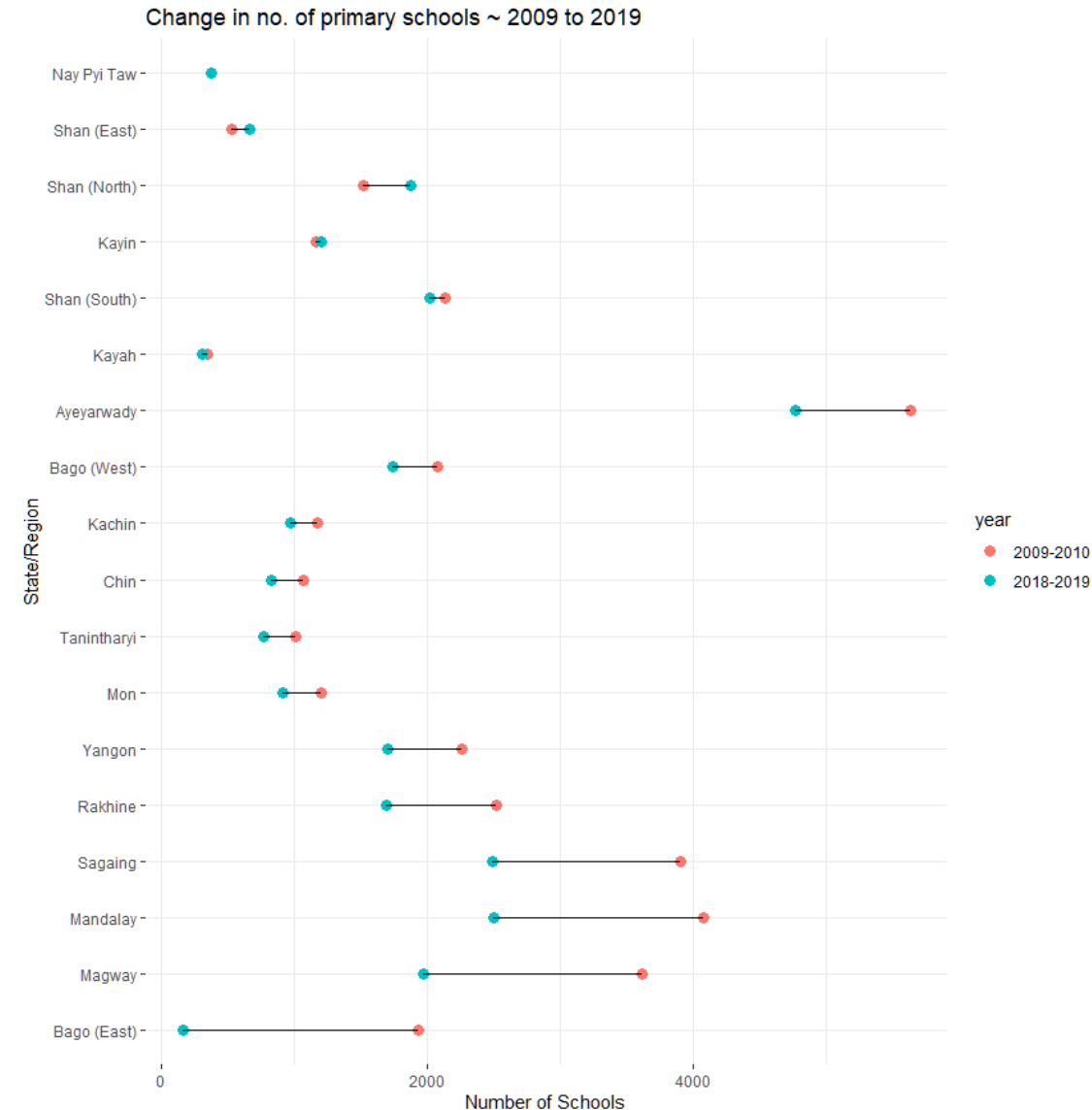
Which State or Region has seen the strongest growth in the number of primary teachers and primary schools since 2009? How does this relate to wealth?

Guidance: The Wealth Ranking Index is only available at the township level, requiring an aggregate measure is created that can be applied to analysis of state and region data.

Data on the number of primary schools by state/region is available in the dataset from the “Education Statistical Yearbook” from 2009-10.

Myanmar – Education Policy Scenario

- We could apply the approach we used in Week 4 using ggplot2 to produce a lollipop chart.
- This is relatively simple in ggplot2, requiring; the normal specification of data/aesthetics and `geom_scatter()` and `geom_line()`.
- See the week 4 suggested answers script for an example.
- This approach could be repeated for the number of teachers

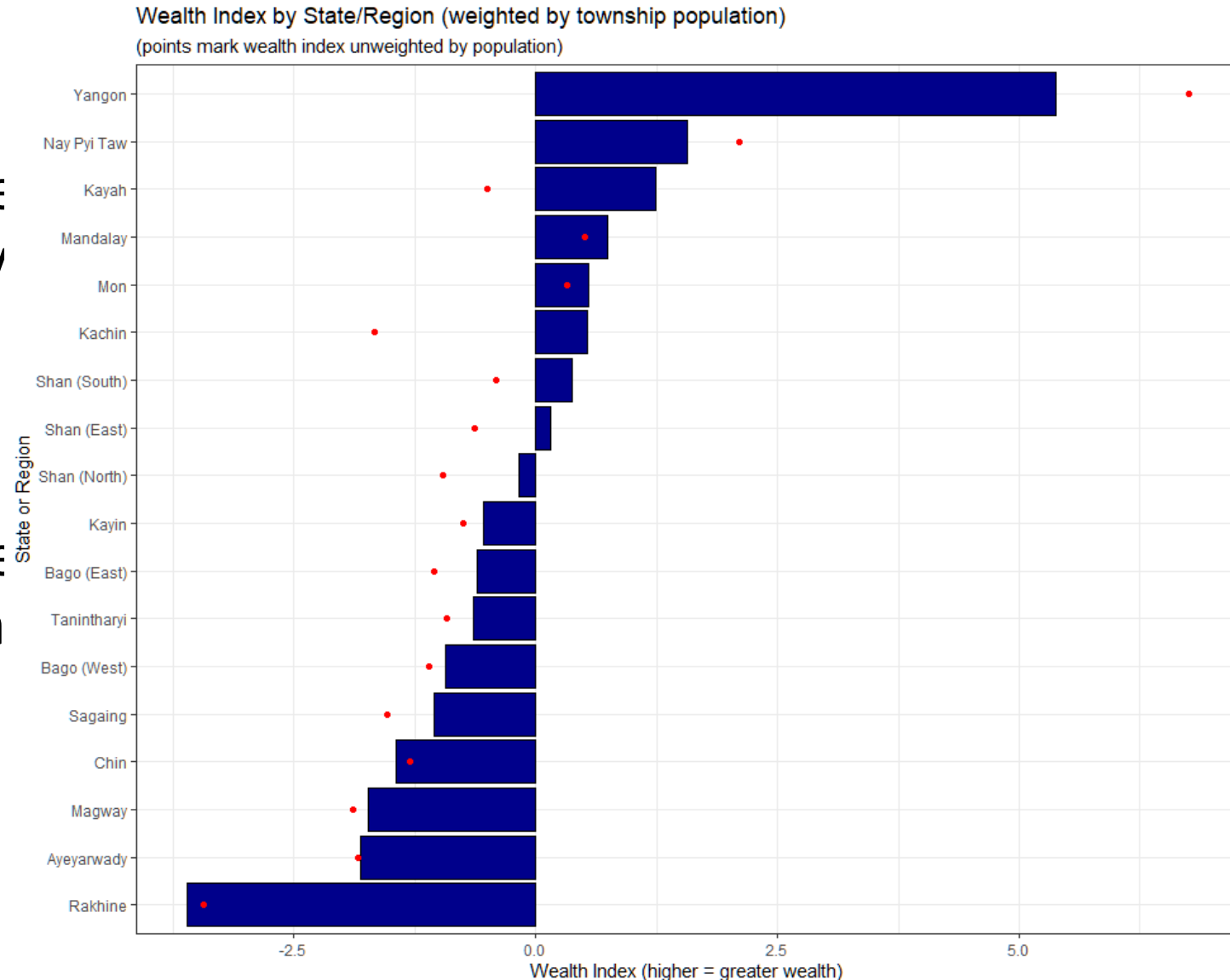


Myanmar – Education Policy Scenario

- To explore how these changes relate to wealth first requires that we identify an appropriate measure for wealth (or a reasonable proxy).
- In State/Region level data there is no direct measure of wealth in the dataset. However, the available measures such as the ‘poverty gap’ and ‘food poverty headcount’ may provide a reasonable proxy.
- An alternative is to use the “Wealth Ranking Index” which is available at the township level. However, to use this measure at the state/region level requires that we account for the different populations of townships to create a ‘population weighted’ average wealth index for each state/region.

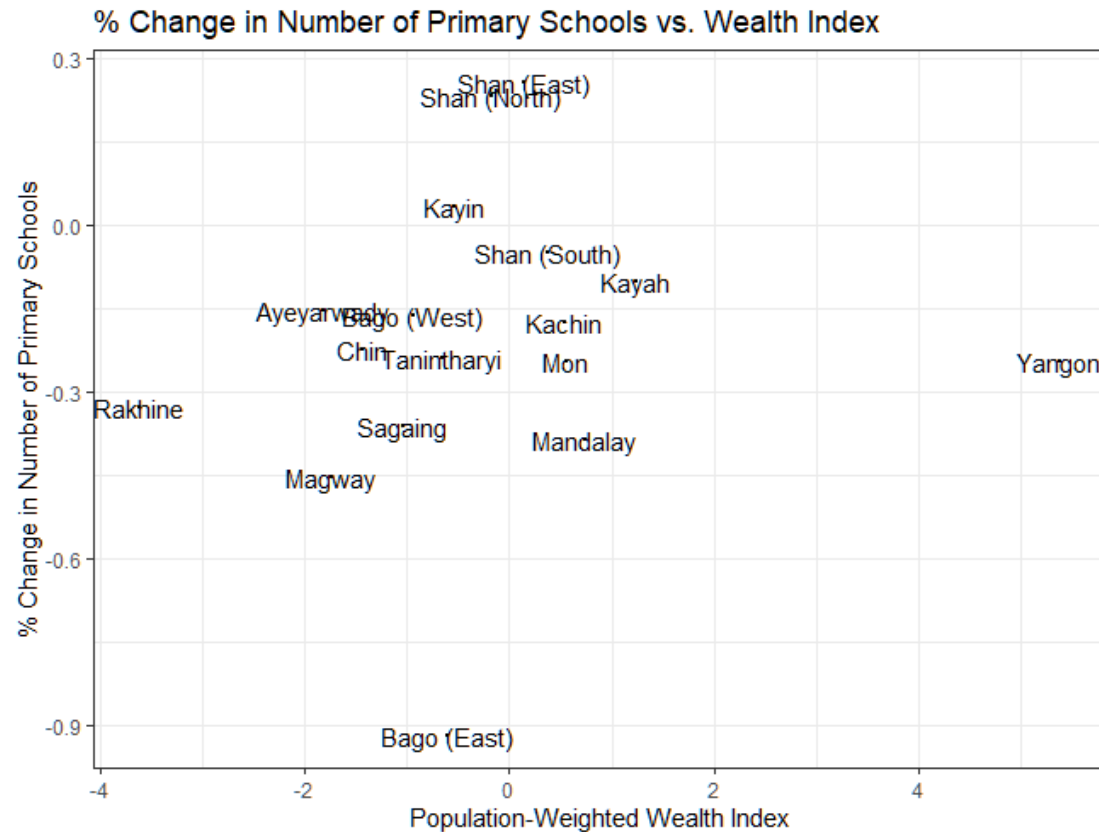
Myanmar – Education Policy Scenario

- This plot shows what the Wealth Index would look like if calculated on a weighted v unweighted basis for States/Regions.
- Unweighted scores will be biased downwards when the number of townships is high relative to population.



Myanmar – Education Policy Scenario

- We can then compare this with school numbers (or the % change) to compare school construction against our proxy for wealth (or poverty etc).



Myanmar – Education Policy Scenario

Using the 2015 Wealth Ranking Index and the maternal mortality ratio, which townships appear most vulnerable?

Guidance: Combining the Wealth Ranking Index and maternal mortality ratio (under 5 per 1000 births) we can identify those townships which are ranked low on the wealth index and experience high levels of maternal mortality.

There is no right or wrong answer, but one approach could be to select all townships which have relatively high infant mortality and low wealth. This could be done using a combination of:

- *summary()* to identify a cut-off for high infant mortality and low wealth; and
- *filter()* for highlighting townships that would meet this criteria.

Myanmar – Education Policy Scenario

Using the 2015 Wealth Ranking Index and the maternal mortality ratio, which townships appear most vulnerable?

Guidance: by finding townships that score poorly on both the maternal mortality ratio (total deaths per 1000 live births) and the wealth ranking index, we can create an (extremely superficial) listing of 'vulnerable' townships.

In R, this can be done by first identifying the values we consider to represent low wealth and high infant mortality and then creating a variable with the value TRUE or FALSE depending on whether a Township has higher mortality AND lower Wealth than our threshold.

The quantile() function can be useful for this, with this calculating the point where 10% of the selected data (if ordered) would fall below eg:

quantile(1:100, 0.25, na.rm=TRUE)

Would return '25'

Myanmar – Education Policy Scenario

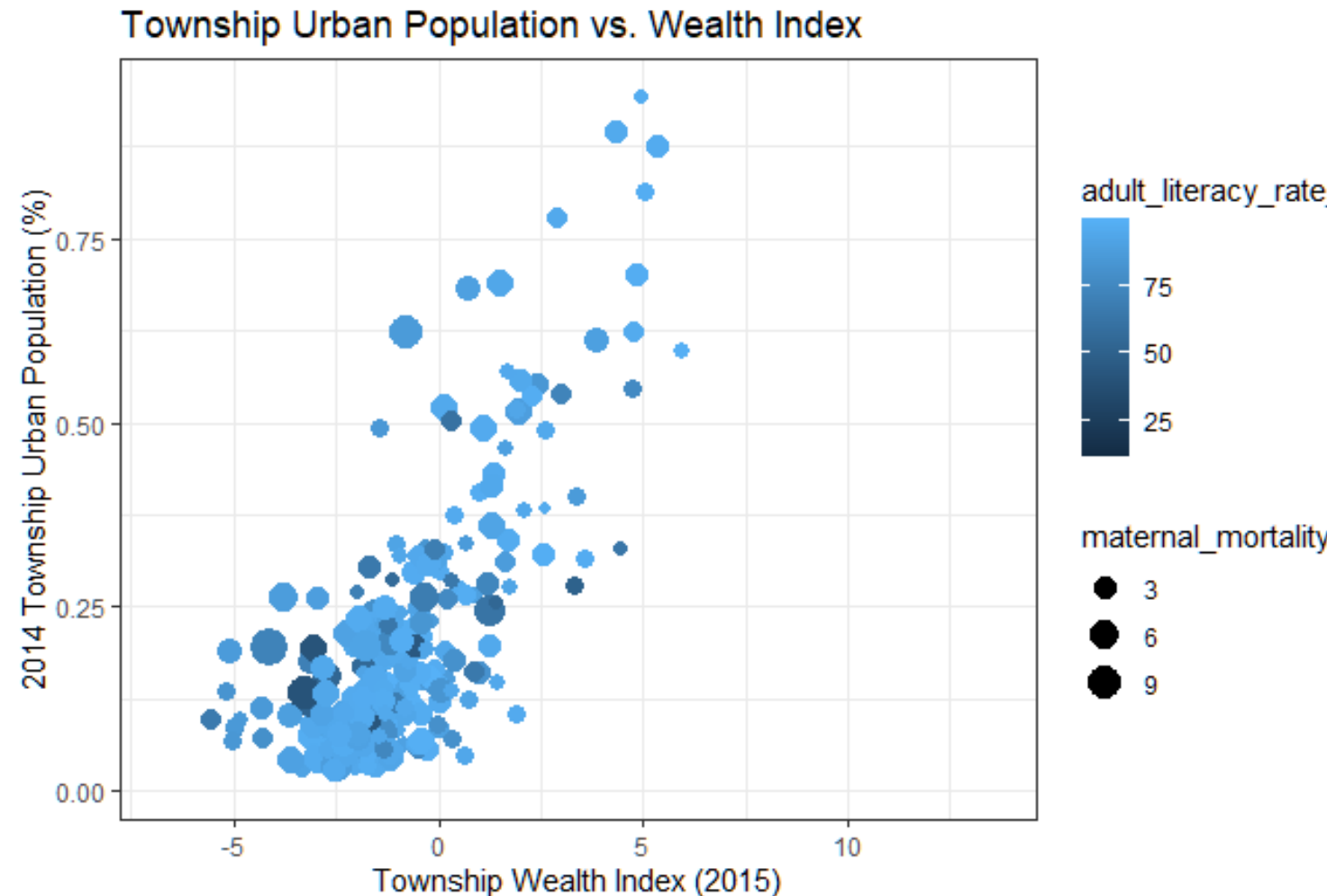
- *Is there a relationship between educational attainment, wealth, maternal mortality and urbanization?*

Guidance: *In its simplest form, a relationship could be investigated by exploring whether a linear pattern exists between the measures of vulnerability, wealth, educational attainment and urbanization.*

While there is no direct measure of urbanization in the dataset we can construct a proxy for this by calculating the % of the population that are considered 'rural' relative to total population which is available in the dataset from the 2014 Myanmar Population and Housing Census

Myanmar – Education Policy Scenario

- There are multiple ways to examine this, but perhaps the *laziest* way is to create a single plot which presents all four measures in one, such as by:
 - Defining the literacy as the color
 - Selecting the point size using maternal mortality; and
 - Plotting township wealth against a township's urban population (as a %).



Myanmar – Education Policy Scenario

- *The Minister has proposed implementing a policy to boost primary enrolment in the most vulnerable rural communities by paying a stipend of 26 USD for all females enrolled in education (between the ages of 5 and 29).*
 - *How much is this likely to cost per year?*
 - *What if this was restricted only to rural and ‘vulnerable’ communities (based on your chosen cutoff for wealth and vulnerability)?*
 - *Which ten townships are likely to benefit the most from this (in \$ terms)?*

Guidance: *An upper limit of the cost of this policy can be discerned readily easily using the state/region dataset.*

However, costs at the township level will need to be calculated using the township dataset. The annual cost can be (naively) calculated using:

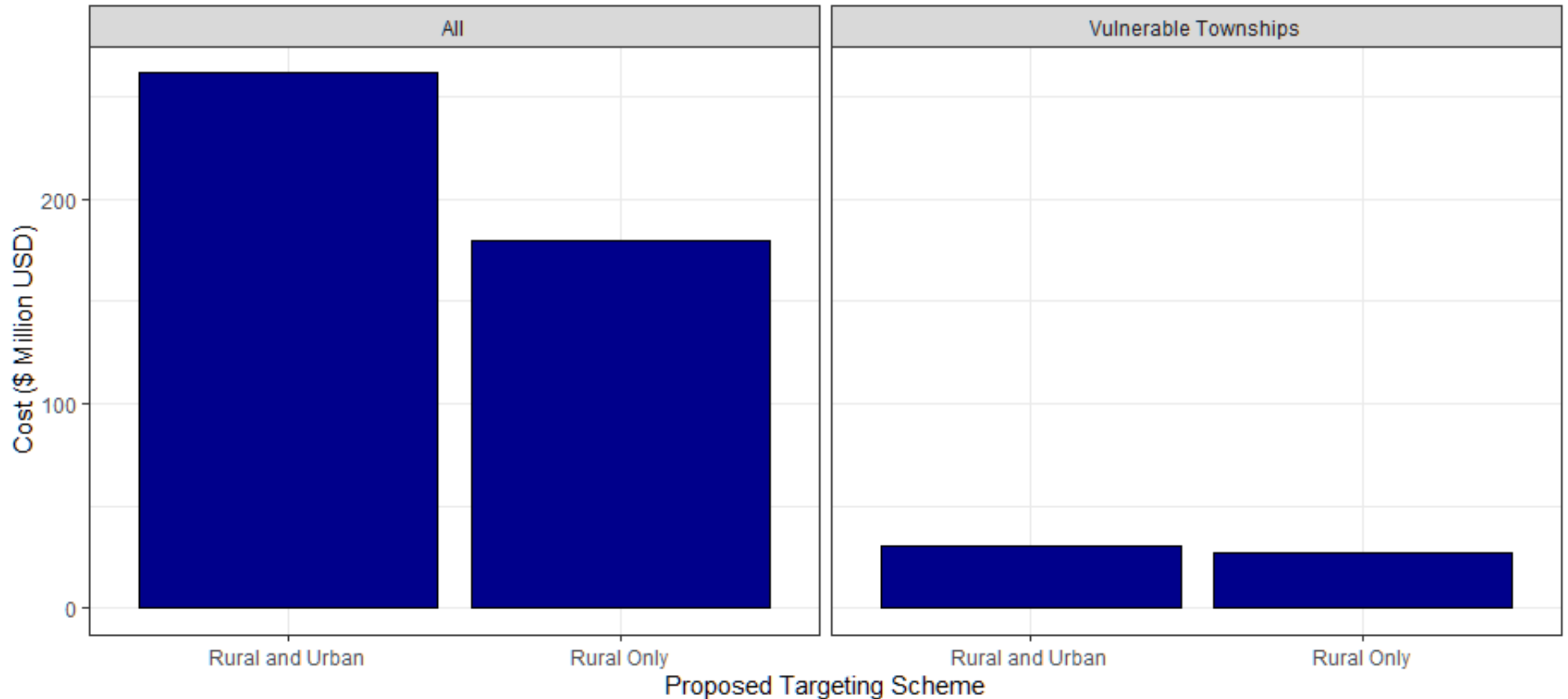
total eligible population x 26 USD

Myanmar – Education Policy Scenario

- **Guidance:** *at the outset, the upper limit for the cost of the policy might be considered as being:*
 - **No targeting:** *The number of women (ages 5 to 29) x 26 USD*
 - **Rural only:** *The number of women in rural communities x 26 USD*
 - **Rural + vulnerable only:** *The number of women in rural communities in the targeted townships x 26 USD.*
- Based on the 2014 estimates available at both the Township and State and Region levels there are approximately 11.2 million women aged between 5 to 29, which comes to a cost of 291 million USD.
- For the rural only alternative, there is no data on the number of women within this age group that also live in rural communities. However, we can make an educated guess based on the % of the population that are not in urban areas.
- For the final policy option we can again use the same approach, focusing only on those townships we've identified to be the most 'vulnerable'.

Myanmar – Education Policy Scenario

Estimated Cost of Education Policy Proposals



Myanmar – Education Policy Scenario

- Finally, determining which townships are likely to benefit the most is something we should already know as in \$ terms this is just those townships with the highest no. of eligible recipients.