Using Existing Data Sets to Evaluate Equity in WaSH: Combining GLAAS & JMP Data
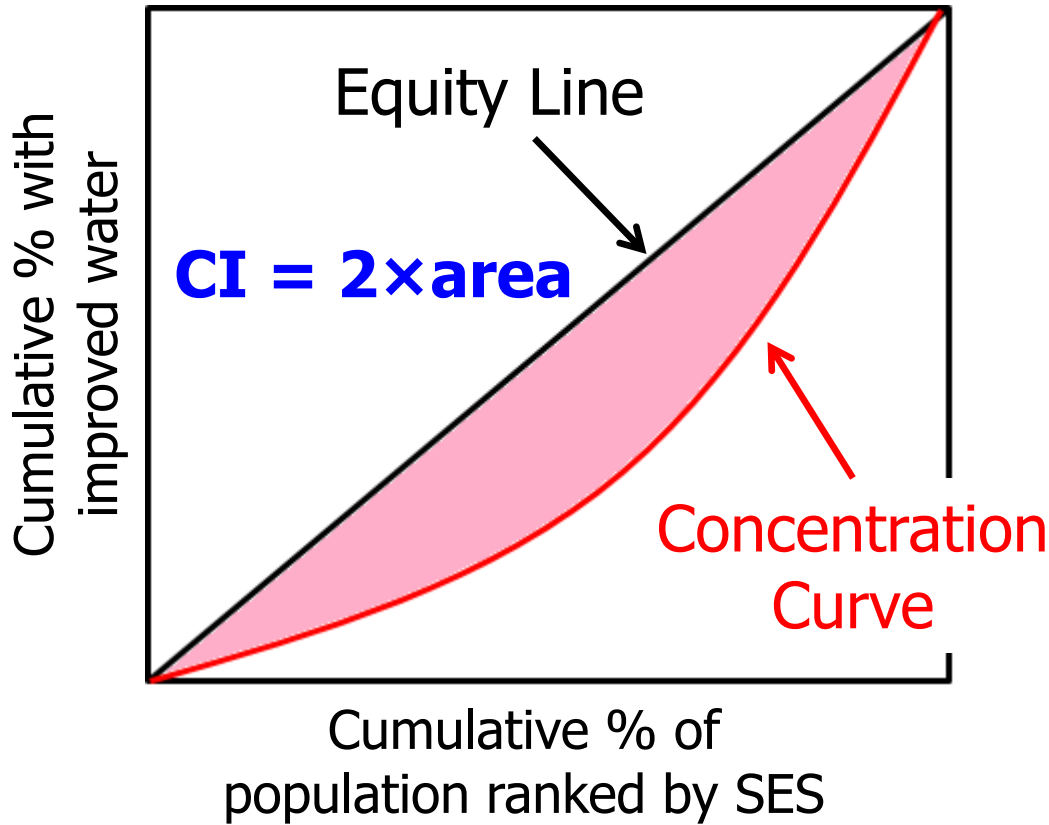
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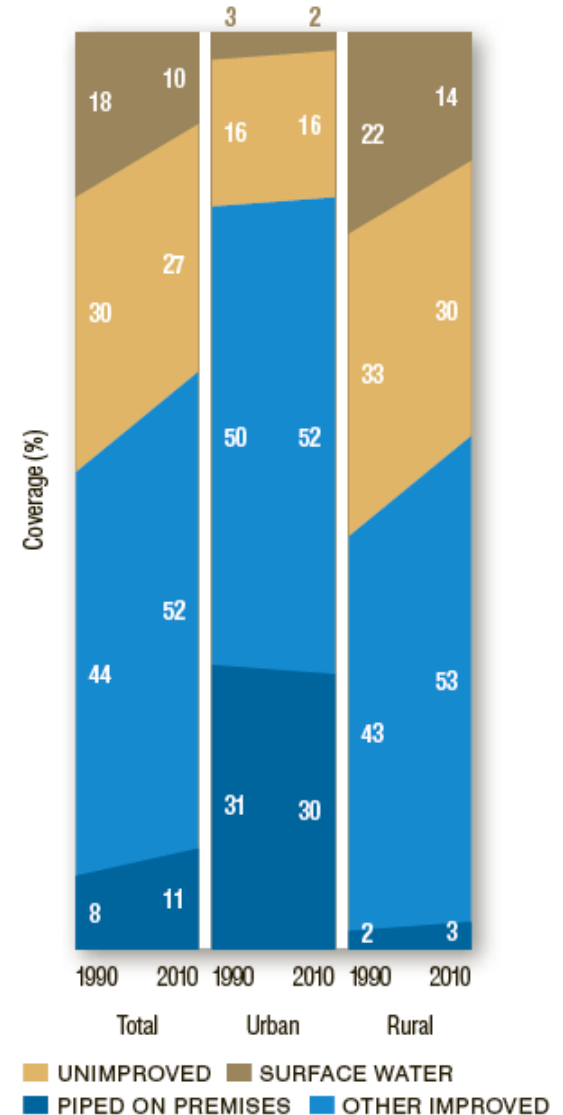
UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH | THE WATER INSTITUTE

Current measures of equity

➢ Socio-economic inequality

Equity Line

CI = 2×area

Concentration Curve

Cumulative % with improved water

Cumulative % of population ranked by SES

How to assess and quantify this progress?

Least developed countries:

Coverage (%)

	3	2	
18			14
	16	16	22
27			30
30			33
	50	52	
52			53
44			43
	31	30	
8	11		2	3

1990 2010 1990 2010 1990 2010
Total Urban Rural

UNIMPROVED   SURFACE WATER
PIPED ON PREMISES   OTHER IMPROVED

Research objectives

1. Identify indicators for which there are existing global data sets that measure State efforts and outcomes

2. Develop a method to assess and quantify progress

3. Synthesize an overall index to allow for comparison

We will use two **example indicators** to show the **development of the methodology**

Indicator #1 (GLAAS data)

➢ What is the estimated percentage of the drinking water budget dedicated for the poor?

  GLAAS answers:

More than 25%	10-25%	Less than 10%

➢ Need to turn these categorical responses into a quantitative value

➢ How to assess whether these estimated budgets are "good" or "bad"? Compare the estimated budget percentage to a target budget percentage

Indicator #1 (GLAAS data)

➢ Defining the target budget percentage

Target budget percentage is proportional to the percentage of the population using an unimproved source, that is in the poorest wealth quintile

Target budget percentage =

$$\frac{(20\% \ of \ pop.) \times (\% \ using \ unimproved \ in \ poorest \ quintile)}{(100\% \ of \ pop.) \times (\% \ using \ unimproved \ in \ total \ population)} \times 100\%$$

Indicator #1 (GLAAS data)

More than 25%	10-25%	Less than 10%

➢ Rural data:

| Country	GLAAS* estimated budget %	Target budget %	Index
Azerbaijan	<10%	19%	0.5
Bangladesh	10-25%	3%	1
Mozambique	>25%	28%	1

Smaller budget ranges or exact percentages
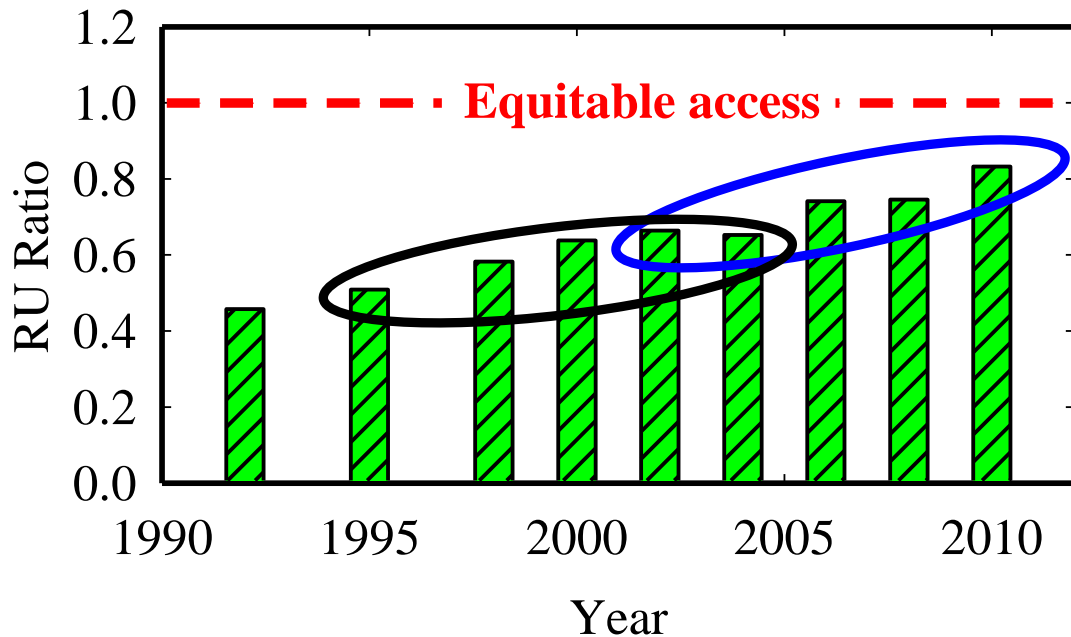would allow for more accurate calculation of an index

Indicator #2 (JMP data)

➤ What is the disparity in access to improved water between rural and urban populations?

➤ How do we determine if progress is being made to reduce this disparity?

Improved Water - Malawi
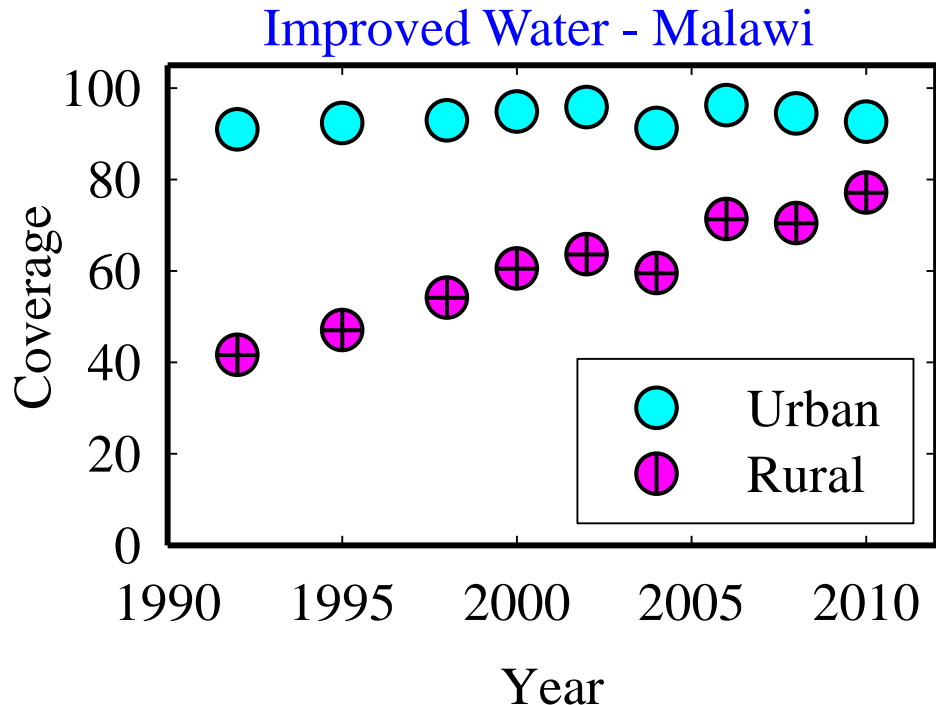
Define a metric to measure disparity:

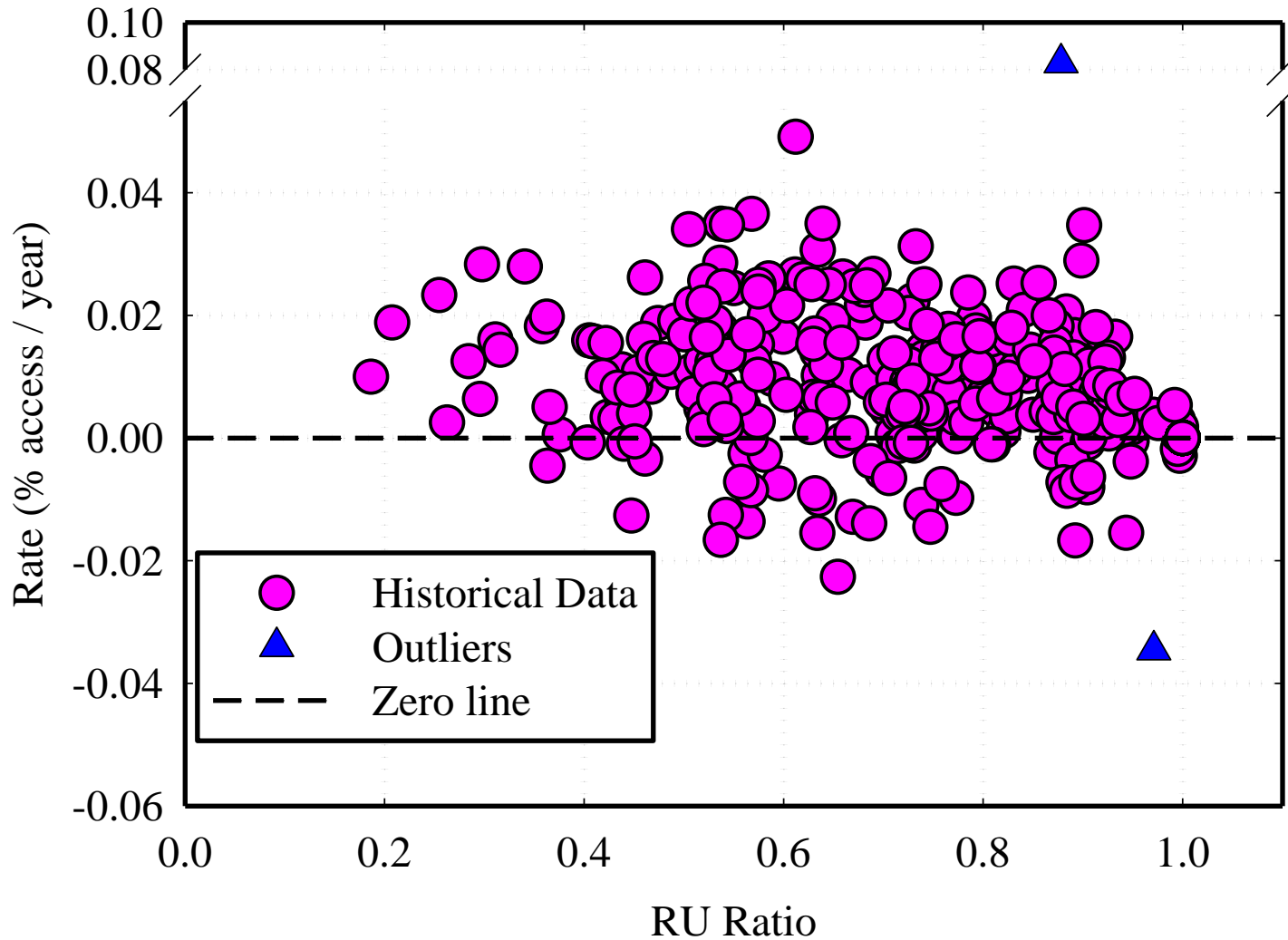$$\text{RU Ratio} = \frac{\text{rural access}}{\text{urban access}}$$

Looking at trends in RU disparity

> RU Ratio shows an increasing trend towards 1

> Moving towards equity
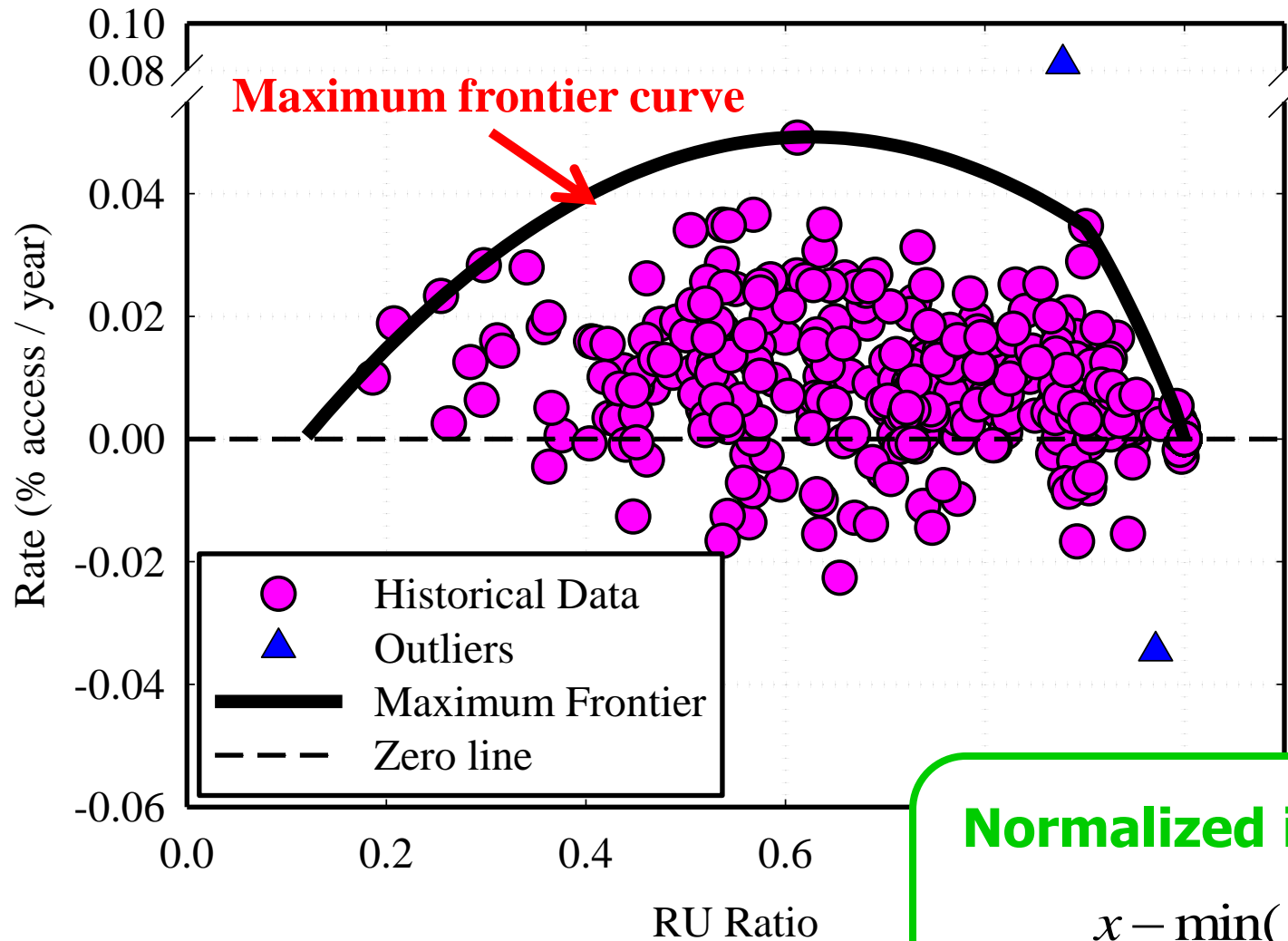
> Is this movement considered "average"? "excellent"?

Obtain slopes (rates of change) for 5-year data groupings
Sign (+ve or –ve) of rates determines regression or progression

Plotting all global rates together

We can now compare rates of change at the same RU Ratio

Defining the benchmark rates

Maximum frontier curve

Normalized index

$$= \frac{x - \min(x)}{\max(x) - \min(x)}$$

> After the ESRF (Economic and Social Rights Fulfillment) Index

# Sample calculation: RU equity

Country	Avg Year	Avg RU Ratio	Rate	Max Rate	Index (frontier)	Index (constant)
Indonesia	2008	0.79	0.006	0.044	0.13	0.12
Malawi	2008	0.79	0.024	0.044	0.53	0.48
Ethiopia	2003	0.26	0.023	0.023	1	0.46

Note that we are measuring how fast equity is approached and NOT the level of equity

Application to wealth quintile analysis

> WQ Ratio = $\dfrac{\text{poorest access}}{\text{richest access}}$
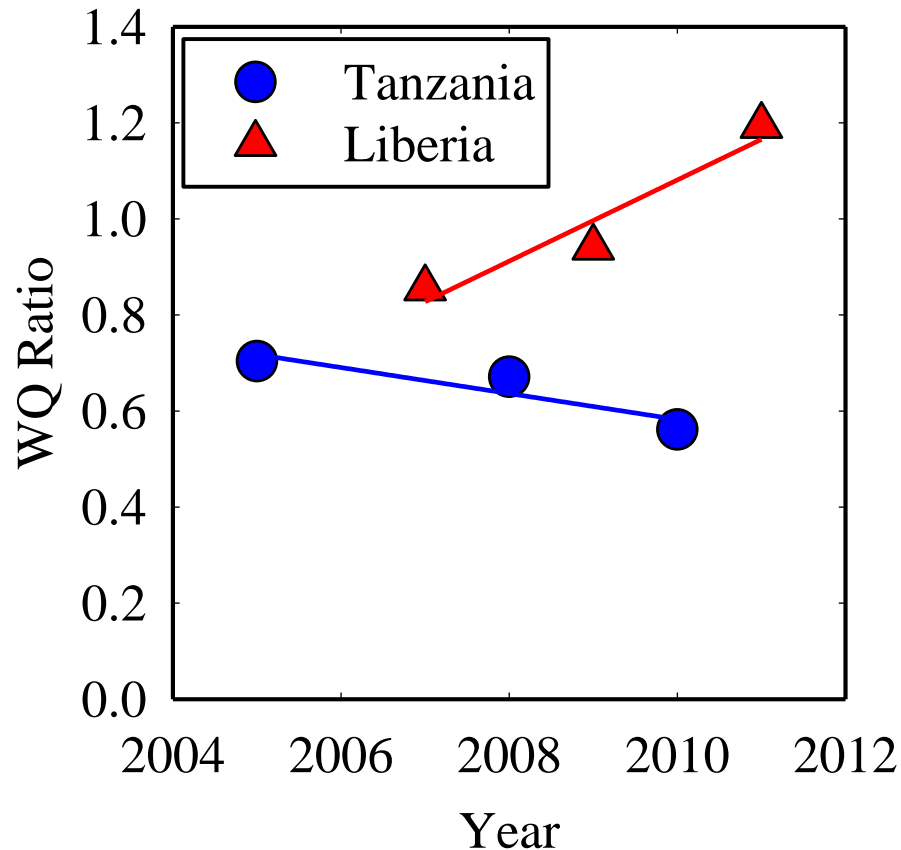
Application to burden of water collection

➢ MF Ratio = $\dfrac{\text{males collect}}{\text{females collect}}$

Country	Year	MF Ratio
Cambodia	2005	1.07
Egypt	2005	0.14
	2008	0.24

More data collection needed to perform complete analysis for WQ and gender of collection

Composite index calculations

Country	GLAAS budget	RU disparity	Composite index
Dominican Republic	1	0.35	0.68
Egypt	1	0.23	0.62
Rwanda	0.5	0.26	0.38
Senegal	0	0.06	0.03

➢ More indicators needed
➢ How to best weigh each type of indicator?

Summary

➢ Existing GLAAS can be used to evaluate the inputs a country makes

➢ Existing JMP data use to evaluate outputs of a country

➢ For output data, we developed a method to quantify and normalize a country's progress against other countries

➢ Creation of a composite index allows both inputs and outputs to be assessed

Thank you