Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

Disaggregation of the SDG indicators related to food and agriculture

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Introduction

- FAO is the custodian UN agency for 21 SDG indicators and is a contributing agency to another five indicators, spanning SDGs 2, 5, 6, 12, 14, and 15.
- FAO is investing in strengthening the capacities of Member countries to collect data and monitor the 21 SDG indicators and their methodologies.

Introduction

- On January 2019, all data disaggregation dimensions and categories for the global SDG indicator framework were compiled after consulting all FAO SDG focal points on disaggregation dimensions and shared with the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs).
- Based on the resulting data disaggregation matrix prepared by the IAEG-SDGs; especially Goal 2 indicators 2.1.1, 2.1.2, 2.3.1 and 2.3.2 and Goal 5 indicator 5.a.1 rely on a larger number of disaggregation dimensions.

M	Minimum Set of Disaggregation	The disaggregation dimensions specifically mentioned in the target or indicator name and information on the categories.
O	Other Current Disaggregation	Any additional data disaggregation dimensions beyond those included in the minimum set for which data are available in the database.
F	Future Additional Disaggregation	Data disaggregation dimensions and categories mentioned in the metadata for the indicator, but not currently included in the database

	Gender	Age	Geographical location (urban/rural)	Other Geographical location - Sub-national (e.g., province)	Income/ economic status/ poor and vulnerable	Ethnicity (indigenous)	Education Level	Type of Enterprise (Farming/ Pastoral/ Forestry/Fisheries)	Size of Enterprise (Small/Medium/Large)	Agroecological zone (Climate variables/ Type of Soil/ Geomorphology)	Type of Tenure (Customary/ Freehold/ Leasehold/Other)	Type of Legally Recognized Document
2.1.1	M	M	F	F	M							
2.1.2	M	M	F	F	M		F					
2.3.1	M	F		O		M		M	M	O		
2.3.2	M	F		O		M		M		O		
5.a.1	M	F	F		F	F					M	F

Introduction

Indicator 2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)

- This indicator provides internationally-comparable estimates of the proportion of the population facing moderate or severe difficulties in accessing food.
- The Food Insecurity Experience Scale (FIES) produces a measure of the severity of food insecurity experienced by individuals or households, based on direct interviews.
- The FIES Survey Module (FIES-SM) is composed of eight questions with simple dichotomous responses ("yes"/"no").
- Respondents are asked whether anytime during a certain reference period they have worried about their ability to obtain enough food, their household has run out of food, or if they have been forced to compromise the quality or quantity of the food they ate due to limited availability of money or other resources to obtain food

Introduction

Indicator 2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)

- As of 2018, over 150 countries' FIES data are available from 2014 to 2018.
- The data source for most of the FAO member countries is the **Gallup World Poll (GWP)**. In addition, FIES compatible data from official national surveys are already available for some countries (the US, Canada, Mexico, Guatemala, Brazil, Ecuador and Seychelles). Morover, since 2015 the FIES has already been included in official surveys in Burkina Faso, Kenya, Pakistan, Indonesia and St. Lucia.
- When food-insecurity prevalence estimates are based on FIES data collected in the GWP, with national sample sizes of **about 1000 in most countries**.
- To reduce the impact of year-to-year sampling variability, country-level estimates are presented as **three-year averages**, computed as averages of all available years in the considered triennia.
- Data have been subject to a validation process and only results validated by national statistical offices are published at country level.

Introduction

- The use of traditional survey tools and sampling methods impose limitations on the production of disaggregated data as well as relevant reliable estimates for small population groups and/or geographical areas.

→ As a result, data are not able to drive the transformative changes required to achieve sustainable development, or shed light on the situation of the most vulnerable groups so as not to "*leave no one behind*".

- The main strategic choice is whether

→ To **limit the use of the data** and allow the dissemination of **only** the main indicators having a certified accuracy

OR

→ To make the system **more flexible** for the users, allowing the production of disaggregated outputs **making users aware of the accuracy of the results**.

- This policy on one hand enhances the relevance of the information disseminated but on the other hand reduces the risk of an inappropriate use of the data.

Methodology

- **Proposed method for the measure of accuracy**: *Global Variance* (*GV*; Wolter, 1986) which is simple to use and to communicate to users.

- Denoted with $\hat{F}$ the estimate of a target parameter for a given population, the estimate of the GV is obtained as the sum of estimates of two components; i.e. the sampling and measurement (or model) variances,

$$\widehat{GV}\left(\hat{F}\right) = V_P\left[\widehat{E_M\left(\hat{F}\right)}\right] + E_P\left[\widehat{V_M\left(\hat{F}\right)}\right] \qquad (1)$$

- The *survey* package in R calculates this estimator (Lumley, T., 2019)

Results

- Results for measure of accuracy estimation for *SDG 2.1.2 - Prevalence of moderate or severe food insecurity in the population*, based on the Food Insecurity Experience Scale (FIES).

→The parameter of interest F is the prevalence of food insecurity at a given level of severity, where $F = \frac{1}{N}\sum_{k\epsilon U} p_k$ and

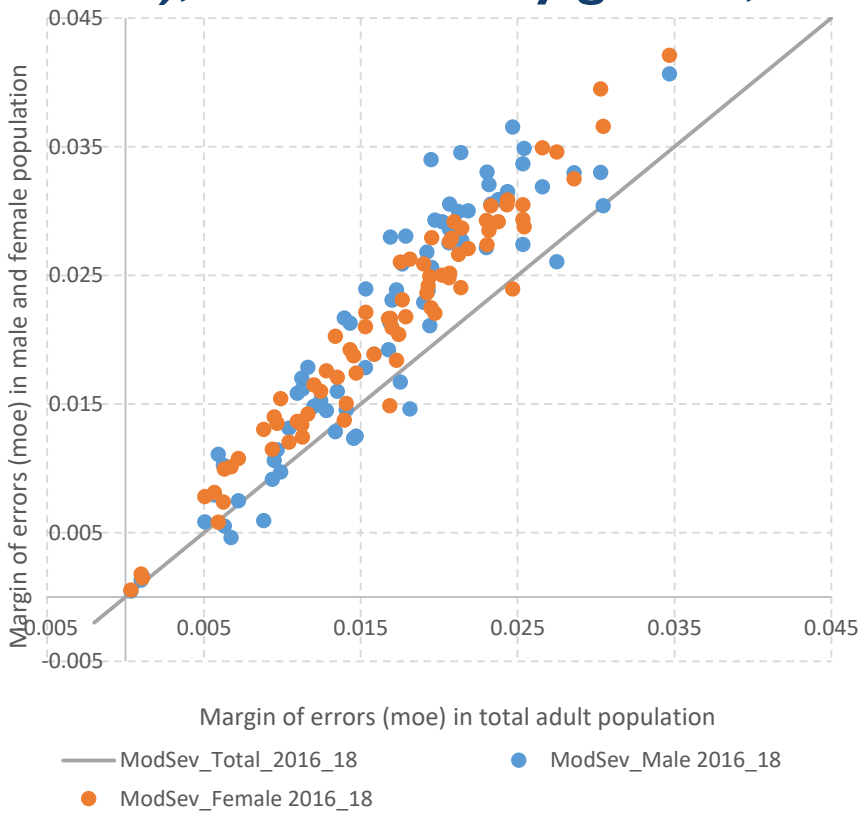
p_k *unknown probability* for the unit *k* of being food insecure at a given level of severity of food insecurity.

Results

- **Geographical coverage:** The results are based on the full list of countries surveyed in the Gallup World Poll and which gave consent for publication of the SDG data; i.e. 77 countries in total.
- **Time series:** 3 year averages 2016-2018
- **Disaggregation:** By gender
- **Margins of error at 90% confidence level** are produced for the prevalence of food insecurity (at moderate or severe and severe only levels) in the adult population and in the population disaggregated by gender.

Results

Margin of errors for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Prevelance at moderate or severe level:	Average Margin of Errors 2016-18	Gender ÷ Total 2016-18
Gallup - Total	0.017	
Gallup - Female	0.021	1.25
Gallup - Male	0.021	1.27

Results

Relative standard error for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:

Prevelance at moderate or severe level 2016-18:	Average RSE	
	Sampling	Measurement
Gallup - Total	7.07	0.59
Gallup - Female	8.62	0.83
Gallup - Male	9.00	0.89

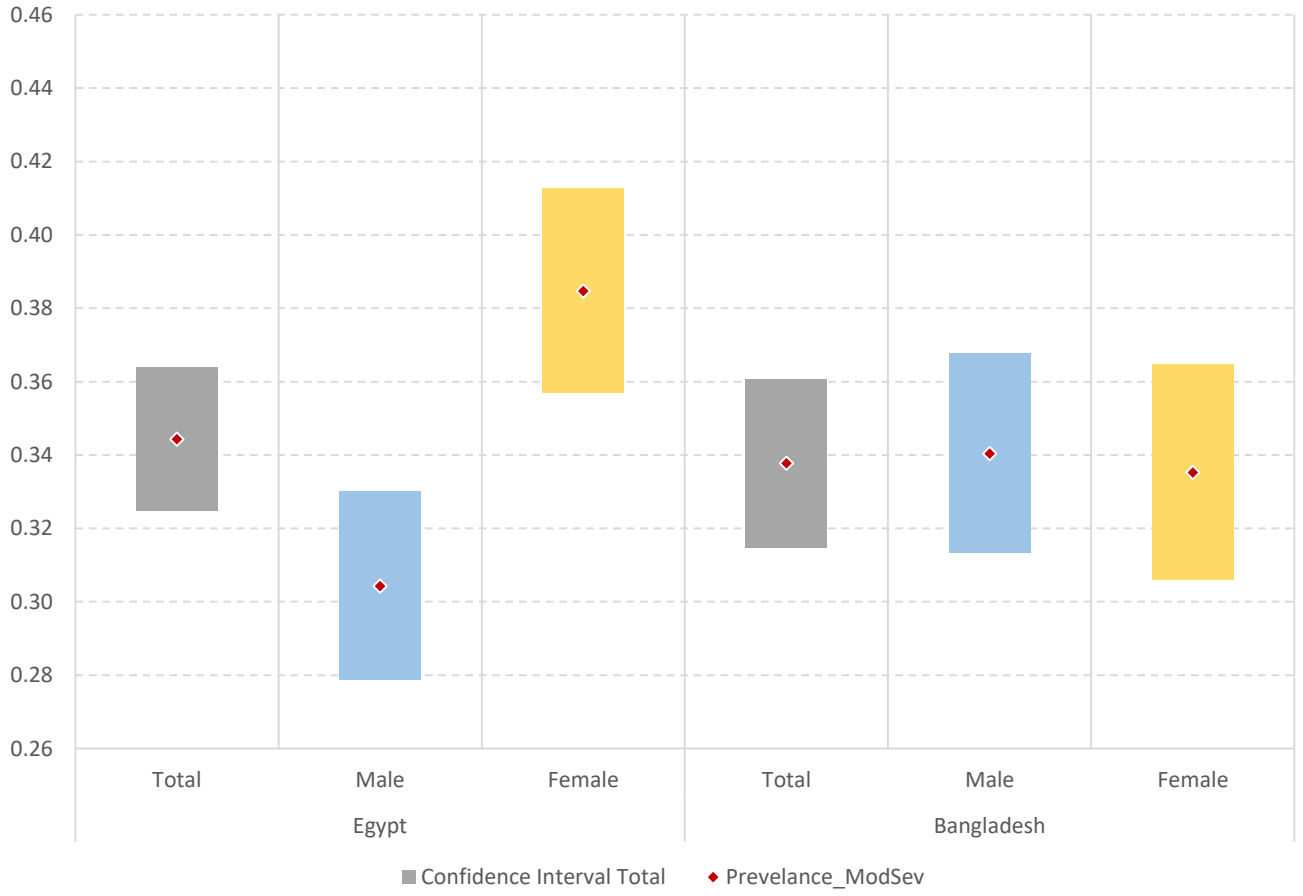
Average Relative Standard Error (RSE) = Average of SE/Prevelance*100

Average ratio between the error (being due to measurement or sampling) **and prevalence rates** at moderate or severe, and severe only, food insecurity, for the adult population (All) and by gender

Margins of error by gender are, on average, approximately 1.3% larger than margins of error of the total prevalence

Results

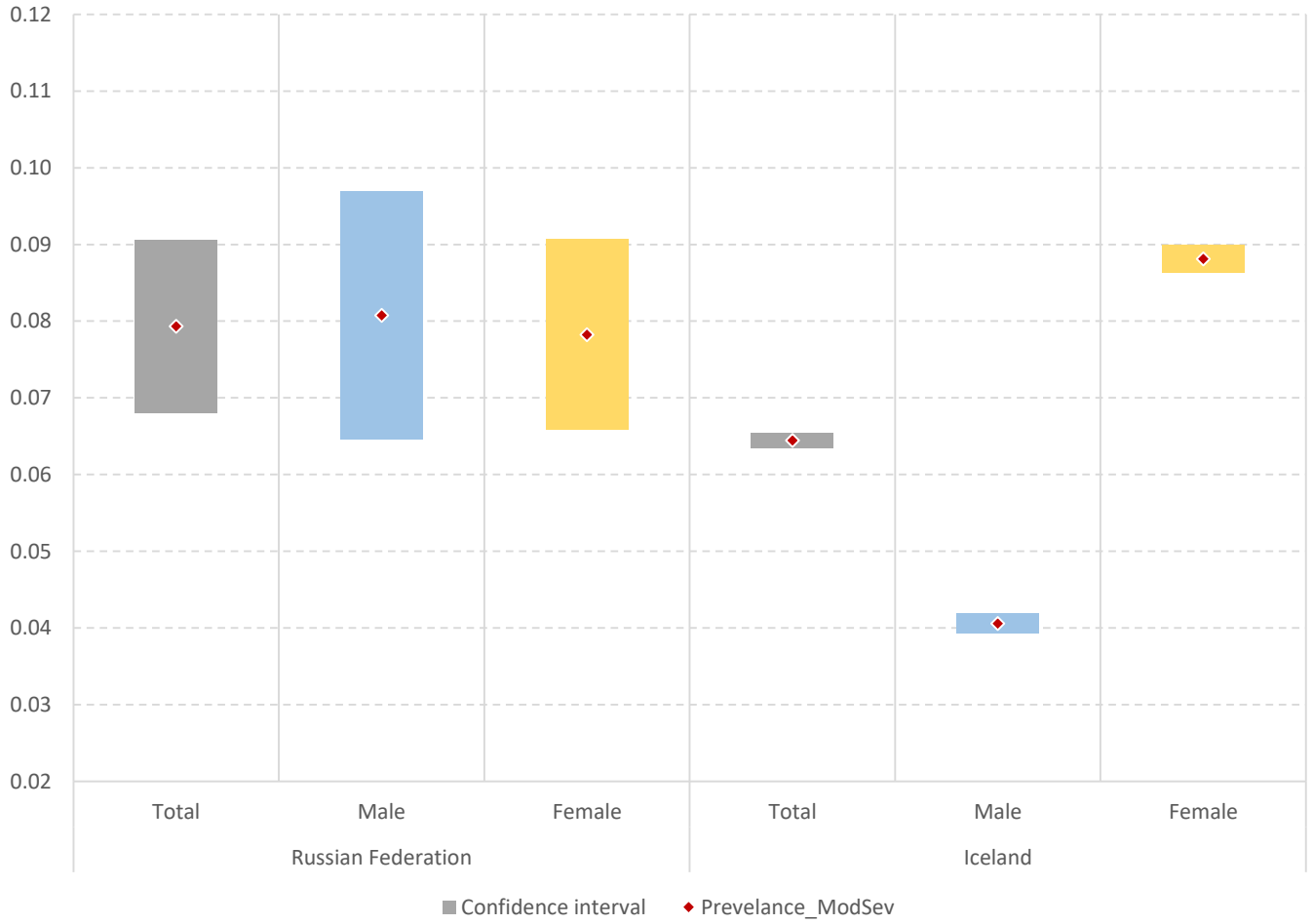
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with large population sizes

Results

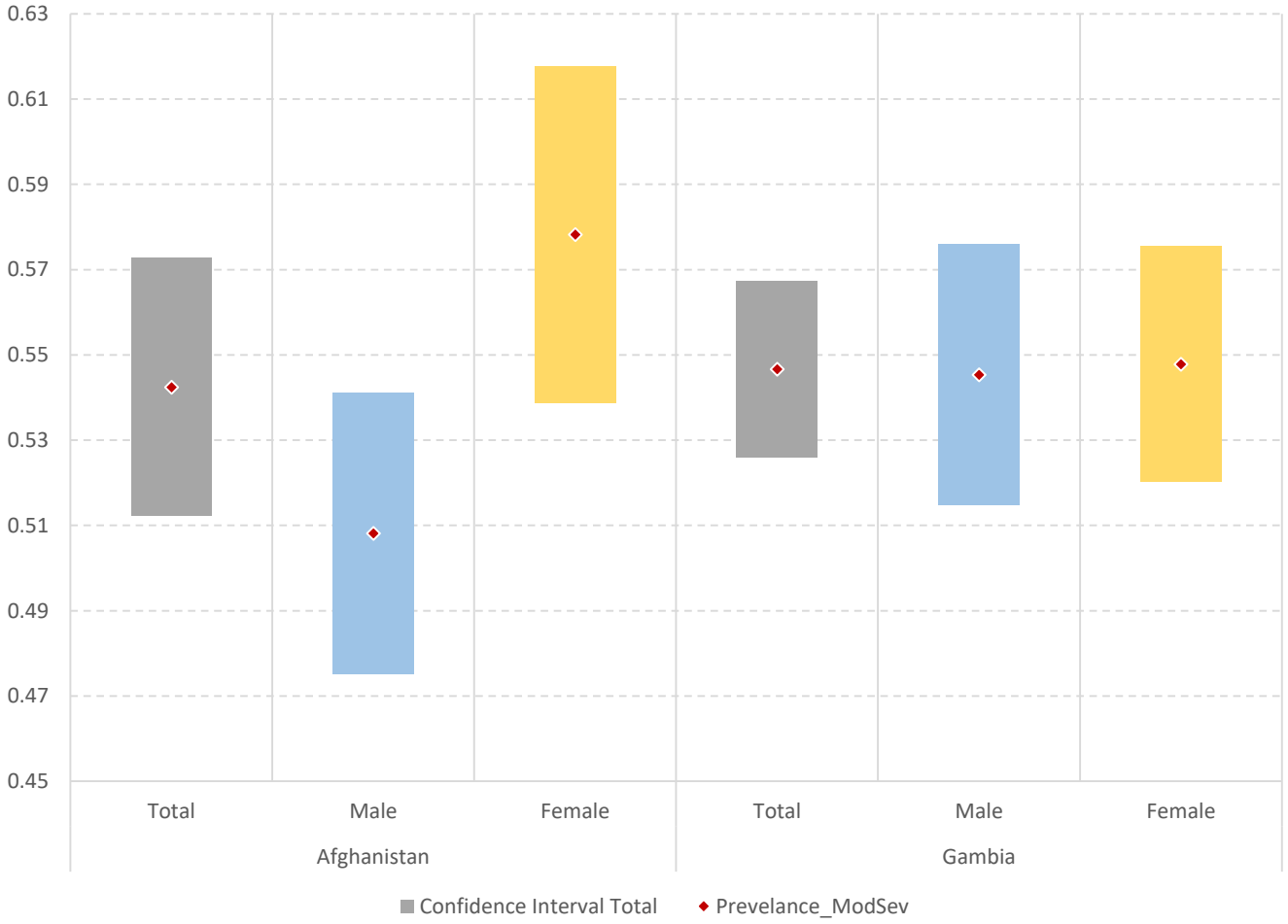
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with large population size versus small population size

Results

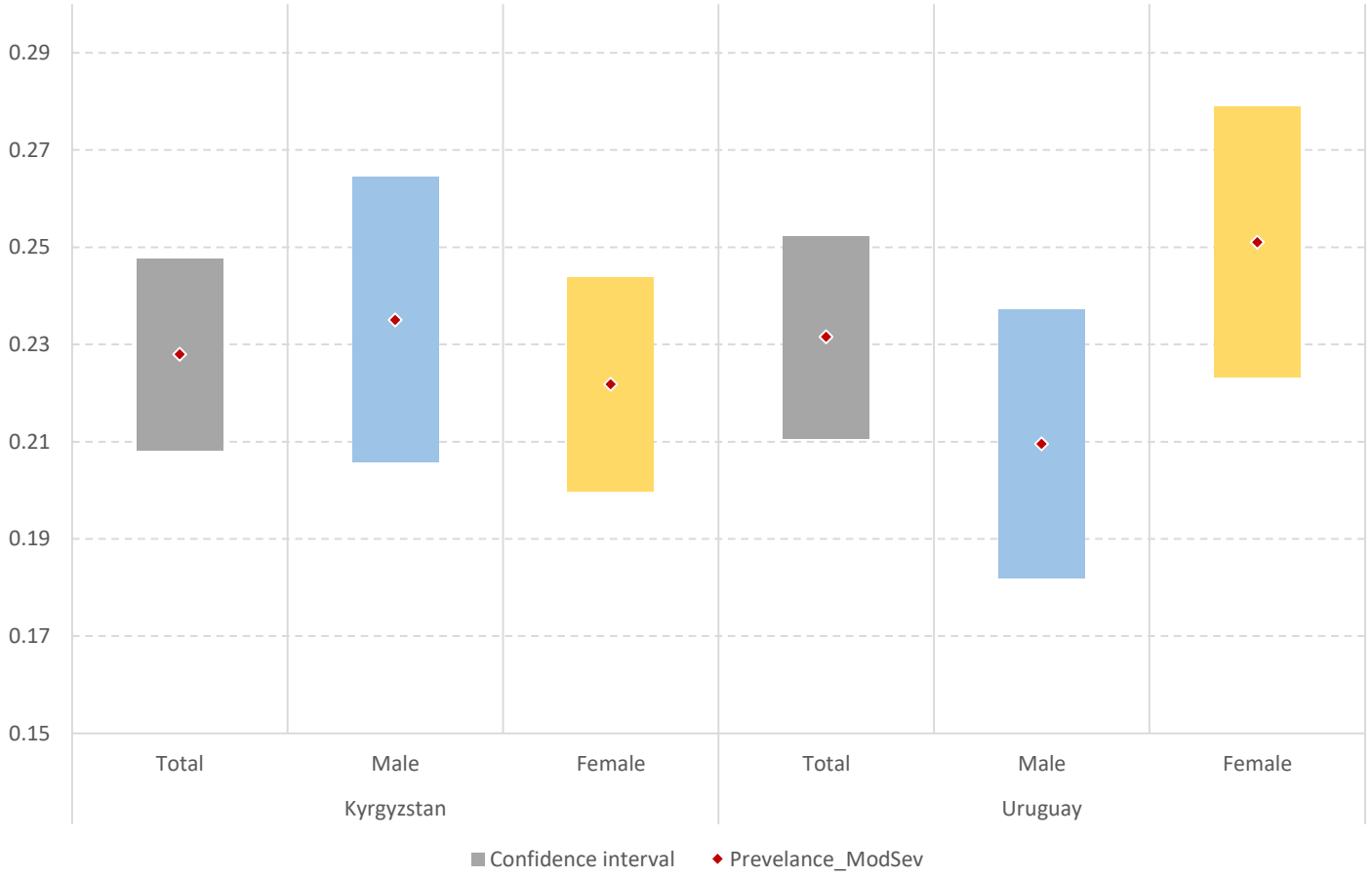
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with different population sizes

Results

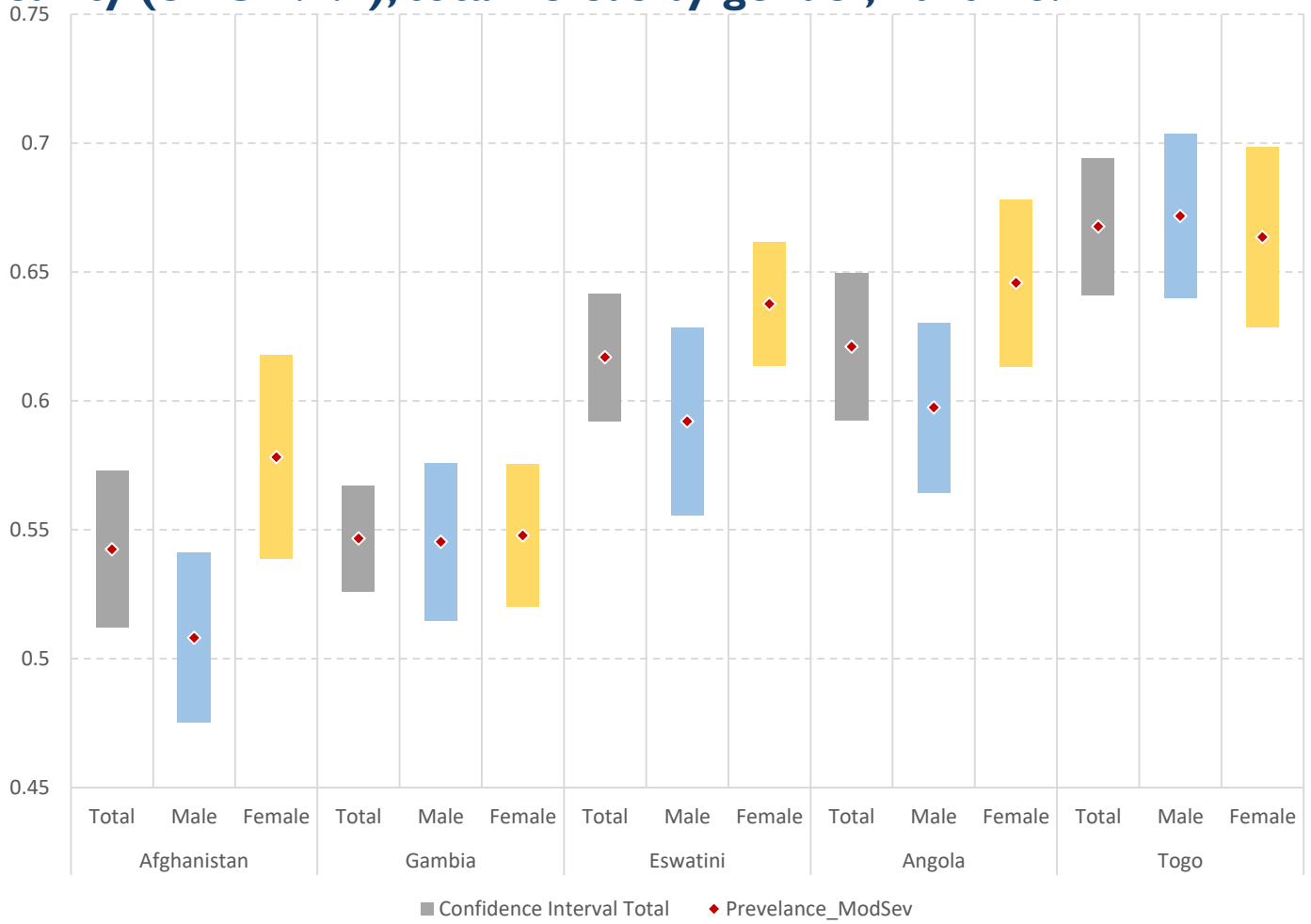
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with different population sizes

Results

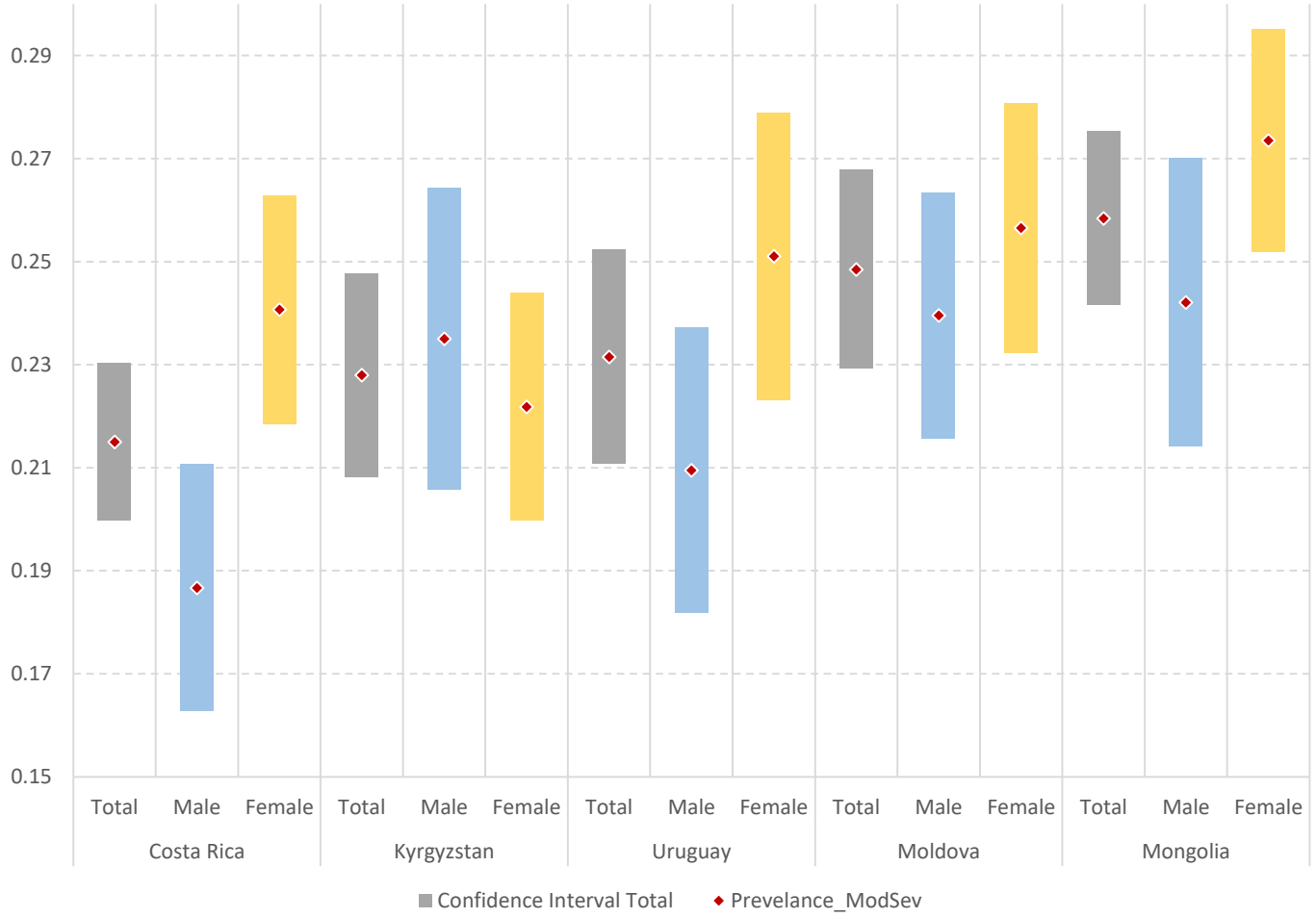
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with different population sizes, with similar prevalence levels

Results

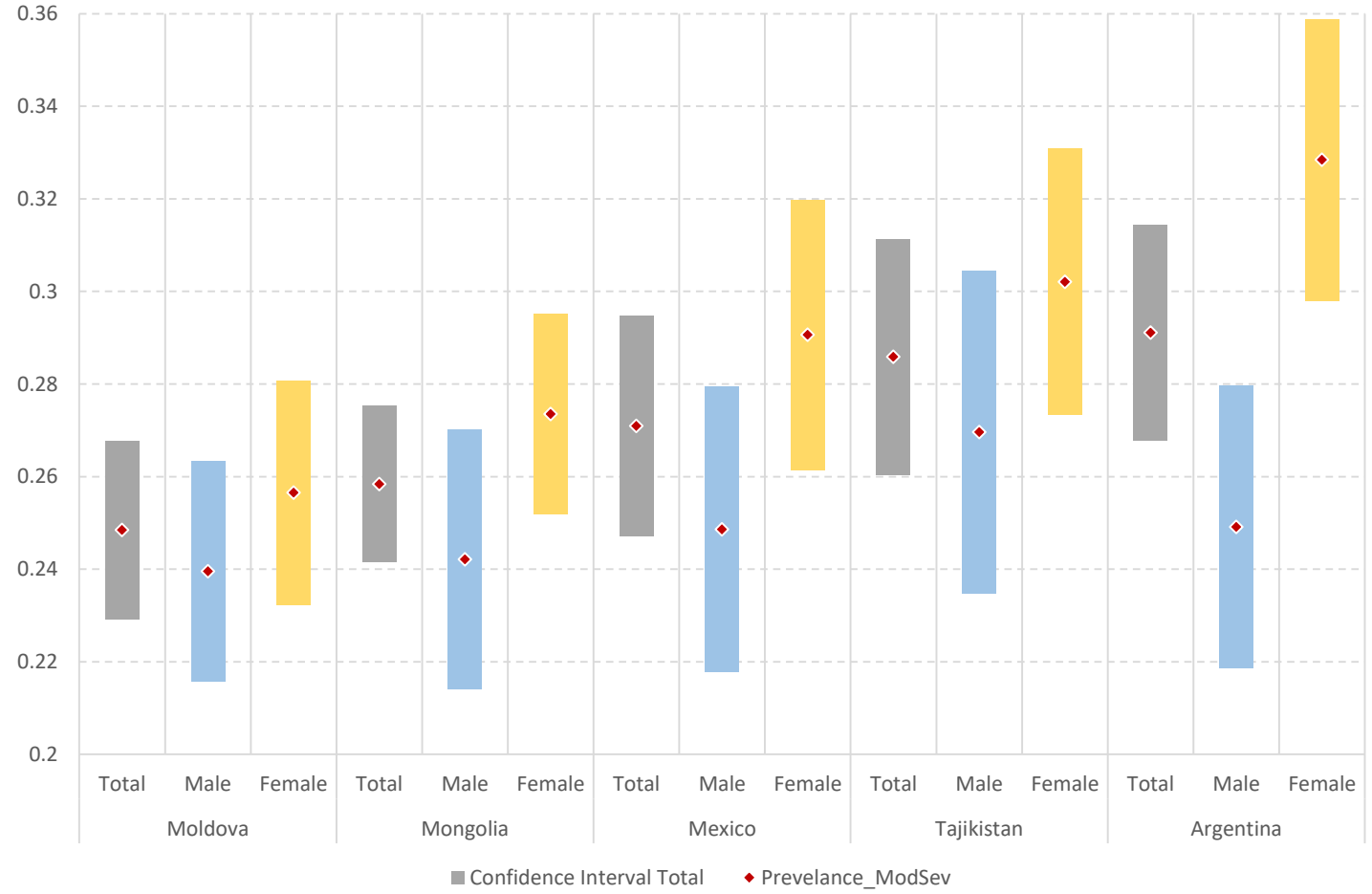
Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with different population sizes, with similar prevalence levels

Results

Confidence interval for the prevalence of moderate or severe food insecurity (SDG 2.1.2), total versus by gender, 2016-18:



Countries with different population sizes, with similar prevalence levels

Conclusions

- It is essential to measure and communicate the accuracy of an estimate. Users should have a say in determining the fitness for use of an estimate.
- With the help of the proposed method for the measure of accuracy, disaggregated data should be disseminated by making users aware of the accuracy of the results.
- GV explicitly considers the main sources of variability and is relatively stable over time, unless there is a change of the sample design properties and of the parameters of the super-population models used for building the predictions.

Future steps

- Comparison with countries using other national surveys (i.e. other than Gallup) that already collect FIES compatible data, such as USA.
- Other disaggregation dimensions; such as geographical – rural/urban
- Other FAO-relevant SDG indicators

Thank You

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References

- Wolter, K. M. (1985) *Introduction to Variance Estimation*, New York, Springer-Verlag.

- Lumley, T. (2019) Analysis of Complex Survey Samples - R package ‘survey’, Link: https://cran.r-project.org/web/packages/survey/survey.pdf

Annex: List of countries (Gallup)

No	Country	No	Country	No	Country
1	Afghanistan	27	Greece	53	Netherlands
2	Albania	28	Guatemala	54	New Zealand
3	Angola	29	Guinea	55	Niger
4	Argentina	30	Honduras	56	Norway
5	Armenia	31	Hungary	57	Philippines
6	Australia	32	Iceland	58	Poland
7	Austria	33	Ireland	59	Portugal
8	Bangladesh	34	Israel	60	Romania
9	Belgium	35	Italy	61	Russia
10	Bosnia and Herzegovina	36	Japan	62	Serbia
11	Botswana	37	Kazakhstan	63	Sierra Leone
12	Bulgaria	38	Kyrgyzstan	64	Singapore
13	Cambodia	39	Latvia	65	Slovakia
14	Cameroon	40	Lesotho	66	South Africa
15	Costa Rica	41	Liberia	67	Republic of Korea
16	Croatia	42	Lithuania	68	Spain
17	Czechia	43	Luxembourg	69	Eswatini
18	Denmark	44	Macedonia	70	Sweden
19	Egypt	45	Mauritius	71	Switzerland
20	El Salvador	46	Mexico	72	Tajikistan
21	Estonia	47	Moldova	73	Togo
22	Finland	48	Mongolia	74	Ukraine
23	France	49	Montenegro	75	United Kingdom of Great Britain and Northern Ireland
24	Gambia	50	Mozambique	76	Uruguay
25	Georgia	51	Namibia	77	Viet Nam
26	Germany	52	Nepal		