

Anthony Burton
formerly, Immunization, Vaccines and Biologicals
World Health Organization, Geneva Switzerland

Swiss TPH Spring Symposium 2017

Evidence Meets Decision Makers: Better Use of Evidence for Better Health

The Truth, the Lie and the In-Between of Data: Focus on Vaccination Coverage

On behalf of the WHO & UNICEF Working Group on Monitoring National
Immunization Coverage

CLM3127
personne prise en flagrant délit de vol sera susceptible de s'acquitter d'un montant de
0.- à titre de contribution aux frais de surveillance et pourra faire l'objet d'une plainte pénale.

Le Matin

Quatre Genevois morts en Norvège: témoignage

LE MATIN

LE MATIN
DIMANCHE

NOUVEAU
FACILE
ET RAPIDE
Payez par SMS
Envoyez LMK127 au 8001

NOUVEAU
FACILE
ET RAPIDE
Payez par SMS
Envoyez TG3127 au 8001

Semaine
Fr. 2.40

Dimanche
Fr. 4.50

Jetons acceptés

avec



Semaine
Fr. 2.80

Samedi
Fr. 3.40

avec



Vos suppléments
gratuits

TribuneExpress

Immobilier

Emploi



Toute personne prise en flagrant délit de vol sera susceptible de s'acquitter d'un montant de
Fr. 100.- à titre de contribution aux frais de surveillance et pourra faire l'objet d'une plainte pénale.

Tribune de Genève

AVALANCHE EN NORVÈGE

Trois Genevois tués

EMPLOI 153 offres

TRIBUNE
DE GENÈVE

The True the Lie and the In-between

- Can both be true?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?
- Can both be mistaken?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?
- Can both be mistaken?
- Can one be the truth and the other a lie?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?
- Can both be mistaken?
- Can one be the truth and the other a lie? Which?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?
- Can both be mistaken?
- Can one be the truth and the other a lie? Which?
- Can one be the truth and the other a mistake? Which?



The True the Lie and the In-between

- Can both be true?
- Can both be a lie?
- Can both be mistaken?
- Can one be the truth and the other a lie? Which?
- Can one be the truth and the other a mistake? Which?
- What might explain the differences?
 - Produced at different times
 - Different definitions.
 - Genevois? Resident? Citizen?
 - Dead in Norway? Killed in an avalanche?



Monitoring Immunization Coverage

- Face value
- Analysis
- Time series

Do you believe?

DTP3 coverage increased from 28% to 68% in Sierra Leone between 1997-8?

OPV3 coverage in Kenya from 1996-1998: 77% - 36% - 64%

**No data available from Norway (Dr. Brundtland's country),
Denmark (Dr. Melgaard's country)?**

Or 98% measles coverage in Iraq in 1998?

OPV3 dropped from 82% to 33% between 1996-7 in Togo

96% DTP3 coverage in Bangladesh in 1999?

92% measles coverage in China in 1999?

*Can we believe the coverage data reported to
WHO*

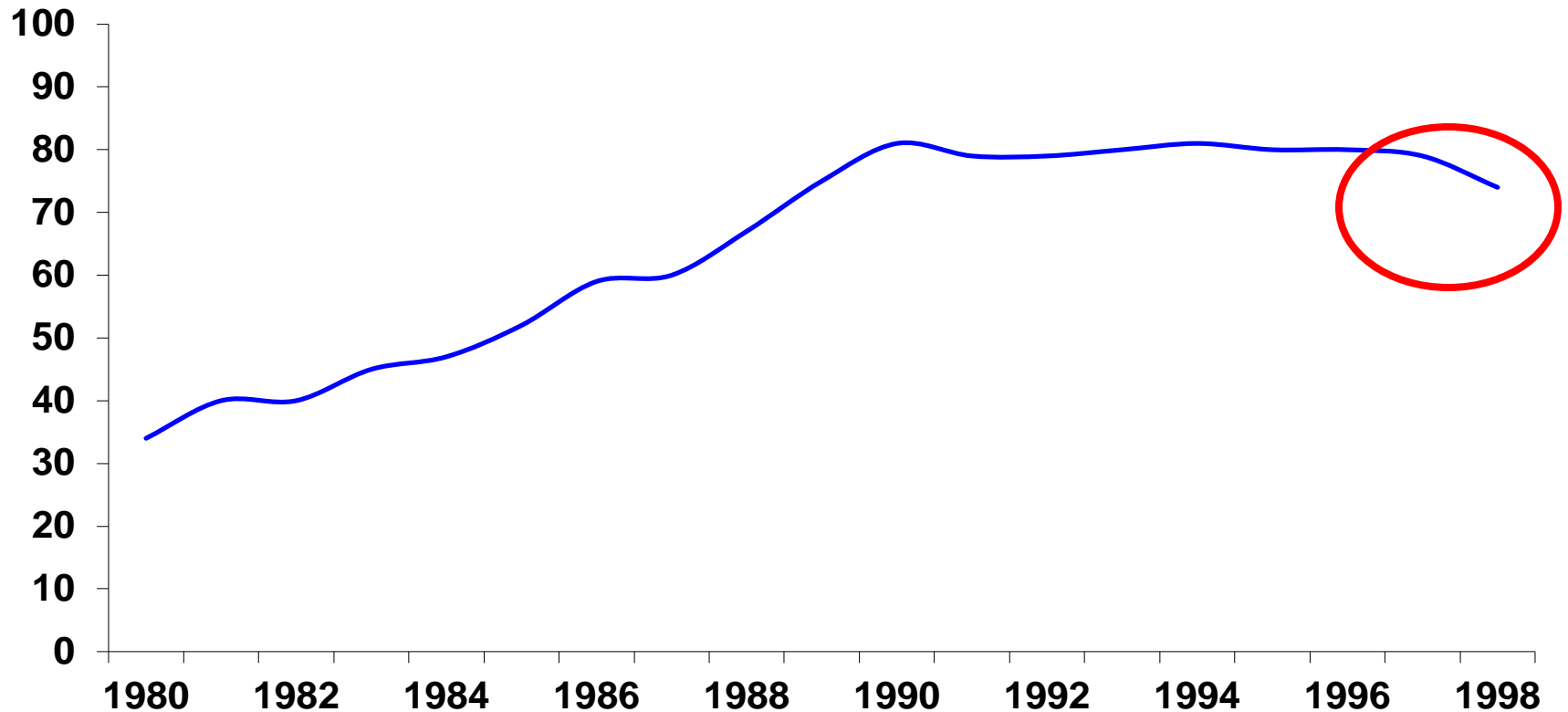
Analysis of reliability and consistency of coverage data from 1991-6

25% of data are missing

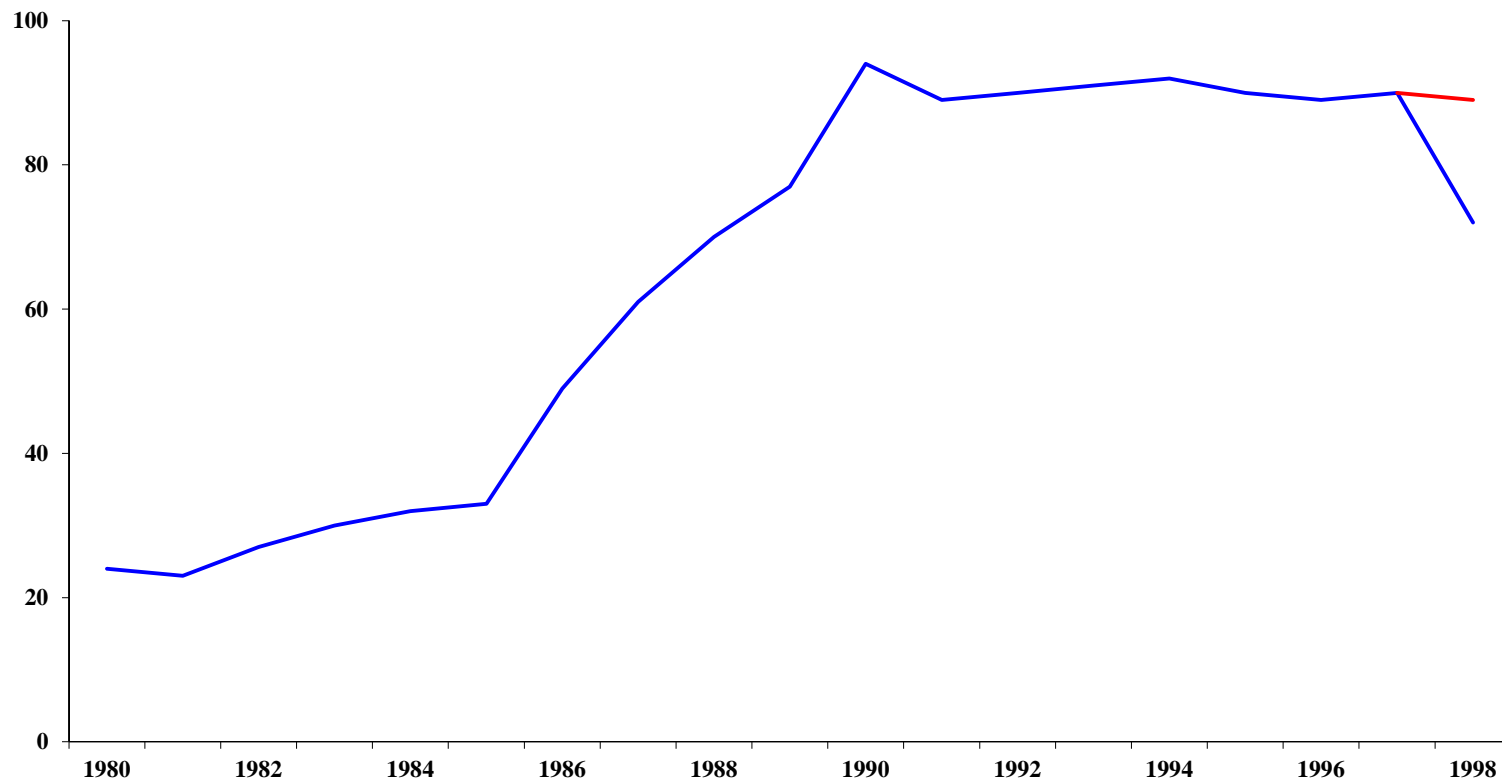
19% of data are "outliers"

"Is coverage REALLY decreasing?"

Global DTP3 coverage, 1980-1998



DTP3 coverage, South East Asia Region, 1980-98



— Official data

— Adjusted for administrative data
from 3 largest countries

Do the data reflect programme
performance?

or

Is there are problem with the
data?

Factors influencing the immunization programme

- Vaccine shortage
- Changes in vaccination schedules
- Additional activities - campaigns
- Change in donor participation
- Changing in staff/commitment
- Political situation
- Administrative changes such as decentralization

WHO & UNICEF monitoring activities on immunization

- WHO & UNICEF Joint Reporting Form on Immunization.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Official submission by member states to UN agencies.
- WHO & UNICEF Estimates of National Immunization Coverage.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Constitutes WHO & UNICEF's technical assessment of coverage

WHO & UNICEF monitoring activities on immunization

- WHO & UNICEF Joint Reporting Form on Immunization.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Official submission by member states to UN agencies.
- WHO & UNICEF Estimates of National Immunization Coverage.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Constitutes WHO & UNICEF's technical assessment of coverage

Reported coverage data: administrative, survey, “official estimate”

Administrative coverage estimates

[\(Table instructions\)](#)

	Vaccine/Supplement	A. Description of the denominator used in coverage calculation	B. Number in target group (denominator)	C. Number of doses administered through routine services (numerator)	D. Percent coverage (=C/B*100)
	<i>Please complete separately for each vaccine, even if they are given in combination (e.g., if Pentavalent vaccine DTP1-HepB-Hib is used, fill in the data for DTP1, HepB3 and Hib3)</i>	(Instructions)	(Instructions)		
4010	BCG	live births			
4020	HepB, birth dose (given within 24 hours of birth)	live births			
4030	DTP1	surviving infants			
4040	DTP3	surviving infants			
4050	Polio3 (OPV or IPV)	surviving infants			
4060	HepB3	surviving infants			
4070	Hib3	surviving infants			
4080	Pneumococcal conjugate vaccine 1st dose	surviving infants			
4090	Pneumococcal conjugate vaccine 3rd dose	surviving infants			
4100	Rotavirus 1st dose	surviving infants			
4110	Rotavirus last dose (2nd or 3rd depending on schedule)	surviving infants			
4120	MCV1 (measles-containing vaccine, 1st dose)	surviving infants			
4130	MCV1 (measles-containing vaccine, 1st dose) Rubella 1 (rubella-containing vaccine)	(Instructions)			
4140	MCV2 (measles-containing vaccine, 2nd dose)				
4150	Yellow fever vaccine	surviving infants			
4160	Vitamin A, 1st dose	less than 59 months			
4170	Vitamin A, 2nd dose	12-59 months			
4180	Japanese encephalitis vaccine				
4190	Tetanus toxoid-containing vaccine (TT2+)	pregnant women (Instructions)			
4200	Protection at birth (PAB) against neonatal tetanus	live births			
4210	Vitamin A doses provided to post-partum mothers	live births			

4. Immunization and Vitamin A Coverage 4B. Coverage Surveys

Conducted in 2011-2013

4410	Year of most recent survey	(Instructions)	<pick one>
4420	Full title of survey in the language of the original report		
4430	Full title of survey in English		

Planned for 2014-2015

4440	Is a coverage survey planned for the next 24 months?	<pick one>
4450	What type of survey is planned? (e.g., MICS, DHS, EPI or CES)	

Please attach a copy of all reports on immunization coverage surveys, other surveys with immunization modules conducted from 2011 to 2013. Make sure to include all surveys reporting on Vitamin A coverage, including nutrition surveys.

[go to next page](#)

5. Official Country Estimates of Immunization Coverage for the Year 2013

[\(Table instructions\)](#)

Please complete separately for each vaccine, even if they are given in combination (e.g., if Pentavalent vaccine DTP1-HepB-Hib is used, fill in the data for DTP1, HepB3 and Hib3)

	Vaccine/Supplement	Official coverage estimates (percent coverage)
5110	BCG	
5120	HepB, birth dose	
5130	DTP1	
5140	DTP3	
5150	Polio3	
5160	HepB3	
5170	Hib3	
5180	Pneumococcal conjugate vaccine 1st dose	
5190	Pneumococcal conjugate vaccine 2nd dose	
5190	Pneumococcal conjugate vaccine 3rd dose	
5190	Rotavirus 1st dose	
5190	Rotavirus last dose (2nd or 3rd depending on schedule)	
5190	MCV1 [measles-containing vaccine, 1st dose]	
5190	Rubella 1 [rubella-containing vaccine]	
5190	MCV2 [measles-containing vaccine, 2nd dose]	
5190	Yellow fever vaccine	
5190	Japanese encephalitis vaccine	
5190	Tetanus A, 1st dose	
5190	Tetanus toxoid-containing vaccine [TT2+] for pregnant women	

Please explain why there are gaps in official estimates and where they come from:

5200	
------	--

[Table instructions](#)

Advantages and disadvantages of administrative and survey methods

Administrative method

Advantages:

- Based on data necessary for service provision
- Timely management monitoring tool
- Provides data at local level

Disadvantage / Limitations :

- Denominator (target population may be projected based on old census data)
- Transcription or calculation errors
- Incomplete reporting
- May Include vaccination conducted outside the target group.
- May not include private sector

Survey method

Advantages:

- Estimate of immunization coverage can be obtained if the denominator is unknown.
- Provides additional information on social economical status of reached and **unreached children**
- Vaccinations given by the private sector reflected

Disadvantage / Limitations:

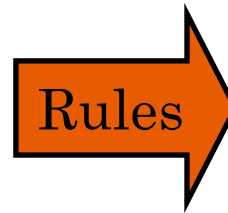
- Provides information on the previous birth year's cohort.
- Immunization card availability
- Reliance on recall in absence of card
- Interviewer interaction
- Length or complexity of the questionnaire may compromise accuracy
- Representativeness of sample

WHO & UNICEF monitoring activities on immunization

- WHO & UNICEF Joint Reporting Form on Immunization.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Official submission by member states to UN agencies.
- WHO & UNICEF Estimates of National Immunization Coverage.
 - Joint WHO & UNICEF activity
 - Begun in 1998
 - Annual process
 - All member states (196 states)
 - Constitutes WHO & UNICEF's technical assessment of coverage

ANNUAL REVIEW OF COVERAGE DATA

- National reports (JRF)
 - Administrative coverage data
 - Country official estimates
- Published and grey literature
 - DHS, MICS (UNICEF), other surveys
- Additional information
 - Stock-outs
 - Data quality audits results
 - Expert opinion / local knowledge



WHO and UNICEF
estimates of ***routine***
infant immunization
coverage
(WUENIC)

Estimation Methods

- Estimate = *reported* data if
 - no other data OR
 - other data do not challenge government reported data
- Challenges arise if *reported* data inconsistent with ...
 - quality survey results
 - across years (sudden, unexplained changes)
 - between vaccines that are administered at about the same time (DTP3 \neq OPV3)
- Decision: what's most consistent with the time series, what are the most likely biases (denominators etc)?
- 100% vaccination coverage not achievable

Estimation Methods

- The estimates are derived from the data using domain-specific rules (Burton, et. al., 2009) expressed as logical conditionals.

If the coverage in country C , for vaccine V , and year Y is reported by the national authorities as P_{rpt}

and survey coverage result for country C , vaccine V and year Y is P_{surv}

and the absolute difference between P_{surv} and P_{rpt} is less than 10

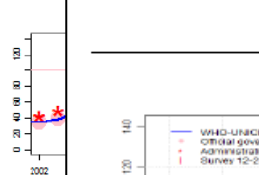
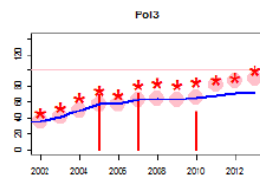
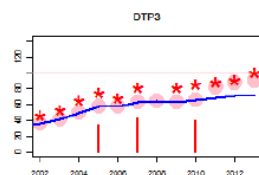
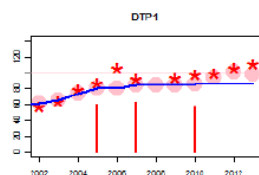
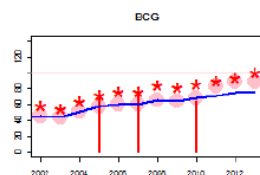
then the estimate for country C , vaccine V and year Y is P_{rpt} .

wuenic ($C, V, Y, Prpt$) :-

reported($C, V, Y, Prpt$),

survey($C, V, Y, Psurv$),

abs($Psurv - Prpt$) < 10.



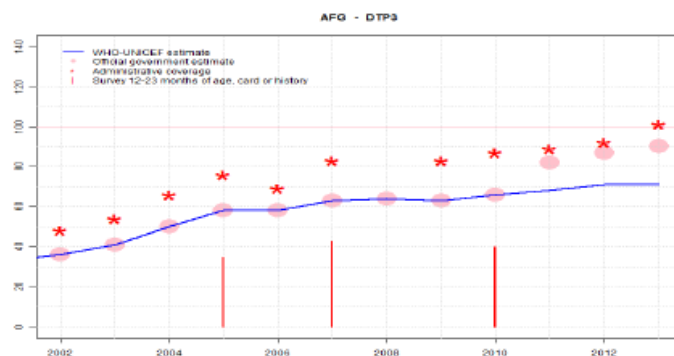
July 8, 2014; page 1

WHO and UNICEF estimates of

Afghanistan - DTP3

Description:

- 2002: Estimate based on coverage reported by national government. Trend in official government estimate follows trend in administrative data. There is significant uncertainty in the provisional estimate due to uncertainty in denominator (last census in 1979) and difficulties in recording and reporting the number of vaccinations delivered by some service providers. GoC=R+ D+
- 2003: Estimate based on coverage reported by national government. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2004: Estimate based on coverage reported by national government. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2005: Estimate based on coverage reported by national government. Afghanistan Health Survey 2006 results ignored by working group. Survey is not nationally representative and does not include 5 provinces. Card retention was 17 percent. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2006: Estimate based on coverage reported by national government. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2007: Estimate based on coverage reported by national government. National Risk and Vulnerability Assessment 2007/8: A profile of Afghanistan results ignored by working group. Survey shows inconsistent results between levels of BCG and DTP coverage. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2008: Estimate based on coverage reported by national government. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2009: Estimate based on coverage reported by national government. Data quality self-assessment conducted in 12 provinces found instances of over reporting and errors in recording and reporting. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2010: Afghanistan Multiple Indicator Cluster Survey 2010-2011 results ignored by working group. Card only data suggest no drop out. Afghanistan Multiple Indicator Cluster Survey 2010-2011 card or history results of 40 percent modified for recall bias to 58 percent based on 1st dose card or history coverage of 58 percent, 1st dose card only coverage of 32 percent and 3d dose card only coverage of 32 percent. Data quality self-assessment conducted in 22 provinces found instances of over reporting and errors in recording and reporting. See comment for 2002 estimates. Estimate challenged by: D-S-
- 2011: Following the trend in administrative levels from 2010. See comment for 2002 estimates. Apparent increase in official reported data between 2010 to 2011 is unexplained as is the inconsistency in adjustments to administrative coverage levels. Estimate challenged by: D-R-S-



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Estimate	36	41	50	58	58	63	64	63	66	68	71	71
Estimate GoC	••	•	•	•	•	•	•	•	•	•	•	•
Official	36	41	50	58	58	63	64	63	66	68	71	71
Administrative	48	54	66	76	69	83	NA	83	87	89	92	101
Survey	NA	NA	NA	35	NA	43	NA	NA	40	NA	NA	NA

The WHO and UNICEF estimates of national immunization coverage (wonic) are based on data and information that are of varying, and, in some instances, unknown quality. Segregating with the 2011 revision we describe the grade of confidence (GoC) we have in these estimates. As there is no underlying probability model upon which the estimates are based, we are unable to present classical measures of uncertainty, e.g., confidence intervals. Moreover, we have chosen not to make subjective estimates of plausibility/certainty ranges around the coverage. The GoC reflects the degree of empirical support upon which the estimates are based. It is not a judgment of the quality of data reported by national authorities.

- Estimate is supported by reported data [R+], coverage recalculated with an independent denominator from the World Population Prospects: 2012 revision from the UN Population Division (D+), and at least one supporting survey within 2 years [S+]. While well supported, the estimate still carries a risk of being wrong.
- Estimate is supported by at least one data source; [R+], [S+], or [D+]; and no data source, [R-], [D-], or [S-], challenges the estimate.
- There are no directly supporting data; or data from at least one source; [R-], [D-], [S-]; challenge the estimate.

In all cases these estimates should be used with caution and should be assessed in light of the objective for which they are being used.

A quick look at two denominator issues

The administrative method: missing data

Vacc1 + Vacc2 + Vacc3

Tg1 + Tg2 + Tg3

310 + 290 + 100

486 + 300 + 214

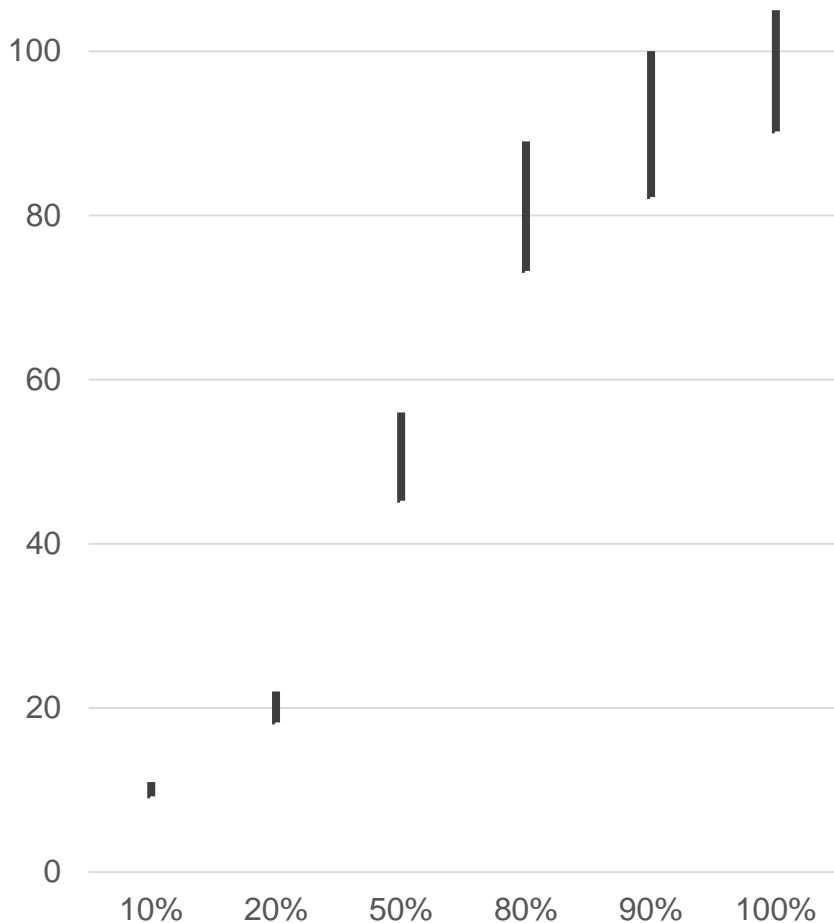
= 70%

$$\frac{310 + 290 + ?}{486 + 300 + 214} = 60\%$$

OR

$$\frac{310 + 290 + ?}{486 + 300 + x} = 76\%$$

Coverage range due to denominator error



	Low	High	Coverage	LB	UB
100	90	110	10%	9 %	11%
100	90	110	20%	18%	22%
100	90	110	50%	45%	56%
100	90	110	80%	73%	89%
100	90	110	90%	82%	100%
100	90	110	95%	86%	105%

Brown, D.W., Burton, A.H., Feeney, G. and Gacic-Dobo, M. (2014) Avoiding the Will O' the Wisp: Challenges in Measuring High Levels of Immunization Coverage with Precision. World Journal of Vaccines, 4, 97-99. <http://dx.doi.org/10.4236/wjv.2014.43012>

A bit in health facility based immunization registries

REGISTRE JOURNALIER DE VACCINATION ENFANTS

10 Février 2011

PT. 51 0129

DATE	N°	NOM ET PRENOM	NOM DE LA MERE	ADRESSE	DATE DE NAISSANCE	VACCINS													VITA A
						Enfant de 0-11 mois	BCG	DTC 1	DTC 2	DTC 3	POLIO 0	POLIO 1	POLIO 2	POLIO 3	A. AMARIL	A ROUGEOLE	ENFANT		
10/02/11	01	Nérolé	Mbatel	Bto	30/01/11	x	x	x			x	x							
	2	Mbiamdine	Mazgoyen	Kamunda	23/01/11	x	x				x								
	3	Doumro	Bte pith	Atrou	07/10/10	x	x	x	x		x	x	x						
	4	Nakda	Losimpato	Bto	06/01/11	x	x	x	x	x	x	x	x						
	5	Sulea	Kadiffa	Bto	2/11/10	x	x	x	x		x	x	x	x					
	6	Néwoté	Kouakou	Atrou	06/01/11	x	x	x	x		x	x	x						
	7	Noudpimbaye	Noudp Kawa	Bto	02/02/11	x	x				x								
	8	Allahanne	Memudigimbaye	Bto	26/12/10	x	x	x	x	x	x	x	x	x					
	9	Népimbaye	Memudigimbaye	Bto	26/12/10	x	x	x	x	x	x	x	x	x					
	10	Djigolbé	Memkoul	Bto	02/02/11	x	x	x			x								
	11	Mbiamdine	Larhichi	Bto	01/11/10	x	x	x	x	x	x	x	x	x					
	12	Ndorembaye	NéKouanodji	Bto	03/01/11	x	x	x	x		x	x	x						
	13	Kouakou	Nérolé	Atrou	06/01/11	x	x	x	x	x	x	x	x	x					
	14	Memudigimbaye	Madpimou	Bto	20/01/11	x	x	x	x		x	x	x						
	15	Deur-ébé	Lachibi	Bto	27/10/10	x	x	x	x		x	x	x						
	16	Mbiamdine	Makébé	Bto	30/01/11	x	x				x								
	17	Josué	Nakoua	Atrou	26/01/11	x	x	x	x		x	x							
	18	Apta	Nawa	Atrou	Sept. 10	x	x	x			x	x							
	19	Lo Kissimbaye	Larpeur	Bto	10/11/10	x	x	x	x		x	x	x						
		Memkoul	DeWadji	Bto	09/11	x	x	x			x	x							
		Mbiamdine	Garempou	Kf	12/12/10	x	x				x	x							
		Memkoul	Garempou	Kf	12/12/10	x	x				x	x							
		Memkoul	Hamadou	Kf	02/01/11	x	x	x			x	x							
		Memkoul	Kawa	Kf	23/12/10	x	x				x	x							

croix dans la case correspondante, pour chaque enfant, la ou les doses de vaccin administrées
croix dans la case correspondante, pour chaque enfant, si une dose de 100 000 UI de vitamine A est administrée

REGISTRE JOURNALIER DE VACCINATION ENFANTS

10 Février 2011

DATE	N°	NOM ET PRENOM	NOM DE LA MERE	ADRESSE	DATE DE NAISSANCE	VACCINS												VITA A	
						Entant de 0-11 mois	BCG	DTC 1	DTC 2	DTC 3	POLIO 0	POLIO 1	POLIO 2	POLIO 3	A AMARIL	A ROUGEOLLE	ENFANT		
10/02/11	01	Nérolele	Hbortel	Bto	30/01/11	x	x	x			x	x							
	2	Hbairandine	Hagoyen	Kamunda	23/01/11	x	x				x								
	3	Doumro	Btchipa	Atrou	07/10/10	x	x	x	x		x	x	x						
	4	Na-nda	Lo-simpato	Bto	06/01/11	x	x	x	x	x	x	x	x						
	5	Sulea	Kadifja	Bto	21/11/10	x	x	x	x		x	x	x	x					
	6	Néwoté	Kouanlan	Atrou	06/01/11	x	x	x	x		x	x	x						
	7	Noudpimbaye	Noudpikawa	Bto	02/02/11	x	x				x								
	8	Allahanni	Hemudigimbaye	Bto	26/12/10	x	x	x	x	x	x	x	x						
	9	Hépimbaye	Hemudigimbaye	Bto	26/12/10	x	x	x	x	x	x	x	x						
	10	Sigolbe	Hem hahel	Bto	02/02/11	x	x	x	x	x	x								
	11	Hbairgimbaye	Lar hidi	Bto	01/11/10	x	x	x	x	x	x	x	x	x					
	12	Ndorelembaye	NéKouanodji	Bto	03/01/11	x	x	x	x		x	x	x						
	13	Kouanatic	Nérolel	Atrou	06/01/11	x	x	x	x	x	x	x	x	x					
	14	Hemadpimbaye	Hadpimbaye	Bto	20/01/11	x	x	x	x		x	x	x						
	15	Deur-eebe	Lachibe	Bto	27/11/10	x	x	x	x		x	x	x						
	16	Hbannodji	Hatubé	Bto	30/01/11	x	x				x								
	17	Tosue	Nakoua	Atrou	26/01/11	x	x	x	x		x	x							
	18	Ahta	Hawa	Atrou	Sept. 10	x	x	x			x	x							
	19	LoKissimbaye	Larpeur	Bto	10/11/10	x	x	x	x		x	x							
		Membebu	DeWadje	Bto	20/05	x	x	x			x	x							
		Hbairnaiten	Garmipote	Bto	12/11/10	x	x				x	x							
		Hbairnaiten	Garmipote	Bto	12/11/10	x	x				x	x							
		Hbairnaiten	Hamasou	Bto	02/11/10	x	x	x			x	x							
		Hbairnaiten	Hawa	Bto	25/11/10	x	x				x	x							

No
dates

croix dans la case correspondante, pour chaque enfant, la ou les doses de vaccin administrées
croix dans la case correspondante, pour chaque enfant, si une dose de 100 000 UI de vitamine A est administrée

Entries
by date
of visit

REGISTRE JOURNALIER DE VACCINATION ENFANTS

10 Février 2011

by date of visit						VACCINS											VITA A
DATE	NOM	NOM DE LA MERE	ADRESSE	DATE DE NAISSANCE	Enfant de 0-11 mois	BCG	DTC 1	DTC 2	DTC 3	POLIO 0	POLIO 1	POLIO 2	POLIO 3	A AMARIL	A ROUGEOLE	ENFANT	
10/01/11	1	Néroléle	Hbortel	Bto	30/01/11	x	x	x		x	x						
	2	Mbairandine	Mazgoyem	Kamunda	27/01/11	x	x			x							
	3	Doumro	Btchipa	Atrou	07/10/10	x	x	x	x	x	x	x					
	4	Nanda	Losimpato	Bto	06/01/11	x	x	x	x	x	x	x					
	5	Sulea	Kadidja	Bto	21/11/10	x	x	x	x	x	x	x	x				
	6	Nénodp	Koumoulam	Atrou	06/01/11	x	x	x	x	x	x	x					
	7	Noudpimbaye	Noudpikawa	Bto	02/02/11	x	x			x							
	8	Allahanni	Méandigimbaye	Bto	26/02/10	x	x	x	x	x	x	x	x				
	9	Népimbaye	Méandigimbaye	Bto	26/02/10	x	x	x	x	x	x	x	x				
	10	Sigilbe	Méankoul	Bto	02/02/11	x	x	x	x	x							
	11	Mbairigimbaye	Larhidi	Bto	01/11/10	x	x	x	x	x	x	x	x				
	12	Ndorembaye	NéKouanodp	Bto	03/01/11	x	x	x	x	x	x	x	x				
	13	Koumaté	Néroléle	Ambata	06/01/11	x	x	x	x	x	x	x	x				
	14	Méandigimbaye	Madpimou	Bto	20/01/11	x	x	x	x	x	x	x	x				
	15	Deuréebe	Ladibé	Bto	27/11/10	x	x	x	x	x	x	x	x				
	16	Mbenodp	Mulibé	Bto	30/01/11	x	x			x							
	17	Togué	Nakoua	Atrou	26/01/11	x	x	x	x	x	x	x	x				
	18	Achta	Nawa	Atrou	Sept. 10	x	x	x		x	x						
	19	LoKissimbaye	Larpour	Bto	10/11/10	x	x	x	x	x	x	x	x				
		Membé	DeWadé	Bto	20/05	x	x	x		x	x						
		Mbairandine	Garmipou	Bto	12/12/10	x	x			x	x						
		Mbairandine	Garmipou	Bto	12/12/10	x	x			x	x						
		Mbairandine	Garmipou	Bto	02/01/11	x	x	x		x	x						
		Mbairandine	Garmipou	Bto	25/12/10	x	x			x	x						

No
dates

croix dans la case correspondante, pour chaque enfant, la ou les doses de vaccin administrées
croix dans la case correspondante, pour chaque enfant, si une dose de 100 000 UI de vitamine A est administrée

Délégation Sanitaire Régionale de : _____
District Sanitaire de : _____
Centre de Santé de : _____
séance du : 25 / 04 / 2013
Stratégie: Fixe : Avancée : Centre c Centre de: Village/Quartier
Stratégie: Mobile : Centre de : Village/Quartier



REGISTRE DE POINTAGE JOURNALIER DES VACCINATIONS - ENFANTS

VACCINS	VACCINATION DES ENFANTS	Nombre de flacons ouverts
	0 - 11 MOIS	
BCG		
Polio 0		
Polio 1		
Polio 2		
Polio 3		
DTC-HepB-Hib1		
DTC-HepB-Hib2		
DTC-HepB-Hib3		
Antirougeoleux		
Anti-amaril (FJ)		
Enfants complètement vaccinés avant 12 mois		

MANIFESTATION ADVERSES POST-INJECTION

Type d'antigènes	Nombre de MAPI Mineure	Nombre de MAPI Majeure

Noms et Prénoms des vaccinateurs : _____

Signature : _____

Date : 25/04/2013

Imp. KOUBIA

Délégation Sanitaire Régionale de :
District Sanitaire de :
Centre de Santé de :
séance du : 25/04/2013
Stratégie: Fixe : Avancée : Centre c Centre de: Village/Quartier
Stratégie: Mobile : Centre de : Village/Quartier



REGISTRE DE POINTAGE JOURNALIER DES VACCINATIONS - ENFANTS

VACCINS	VACCINATION DE	
	0 - 12	
BCG	///	///
Polio 0	///	///
Polio 1	///	///
Polio 2	///	///
Polio 3	///	///
DTC-HepB-Hib1	///	///
DTC-HepB-Hib2	///	///
DTC-HepB-Hib3	///	///
Antirougeoleux		
Anti-amaril (FJ)		
Enfants complètement vaccinés avant 12 mois		

No measles
vaccination

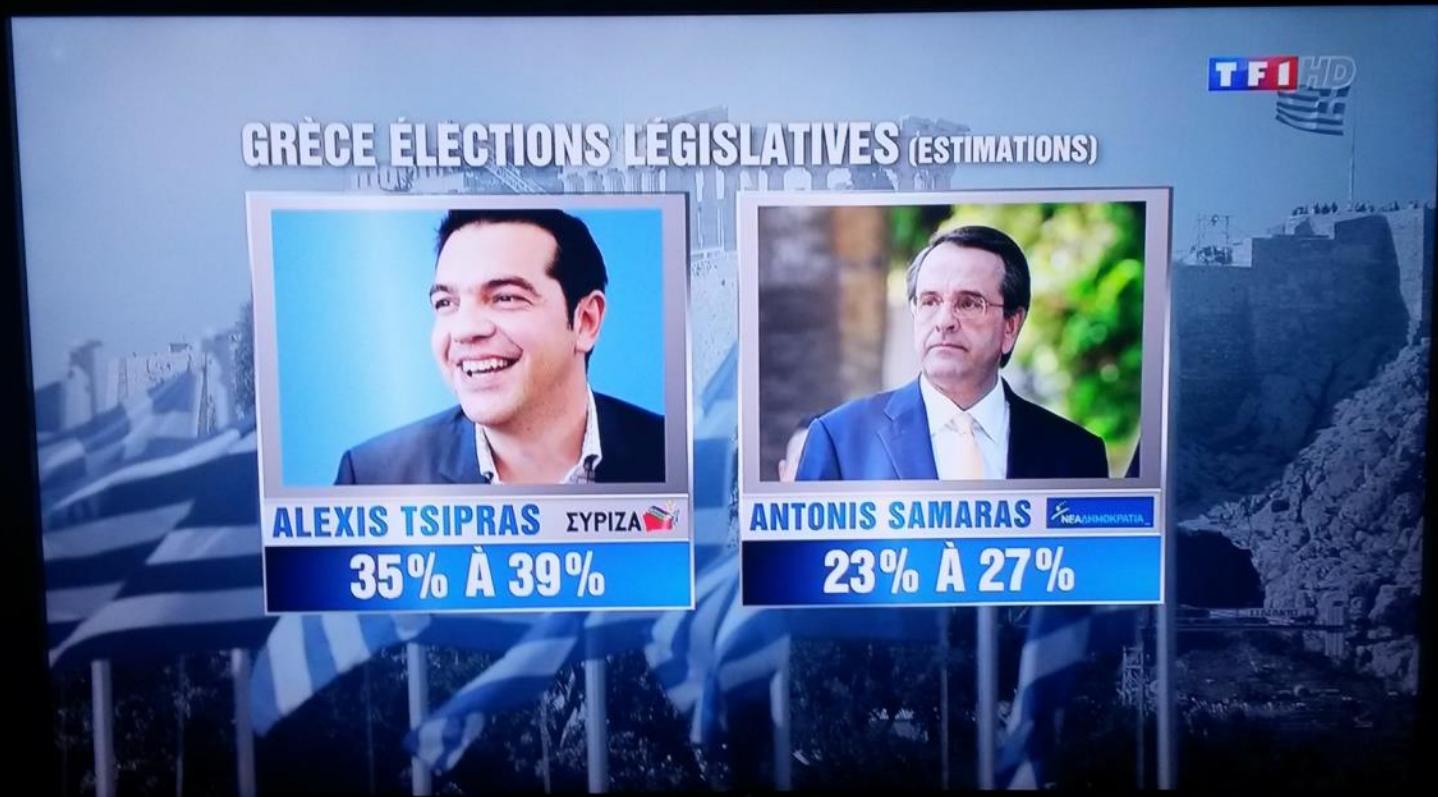
MANIFESTATION ADVERSES POST-INJECTION

Type d'antigènes	Nombre de MAPI Mineure	Nombre de MAPI Majeure
Noms et Prénoms des vaccinateurs :		
Signature :		Date : 25/04/2013

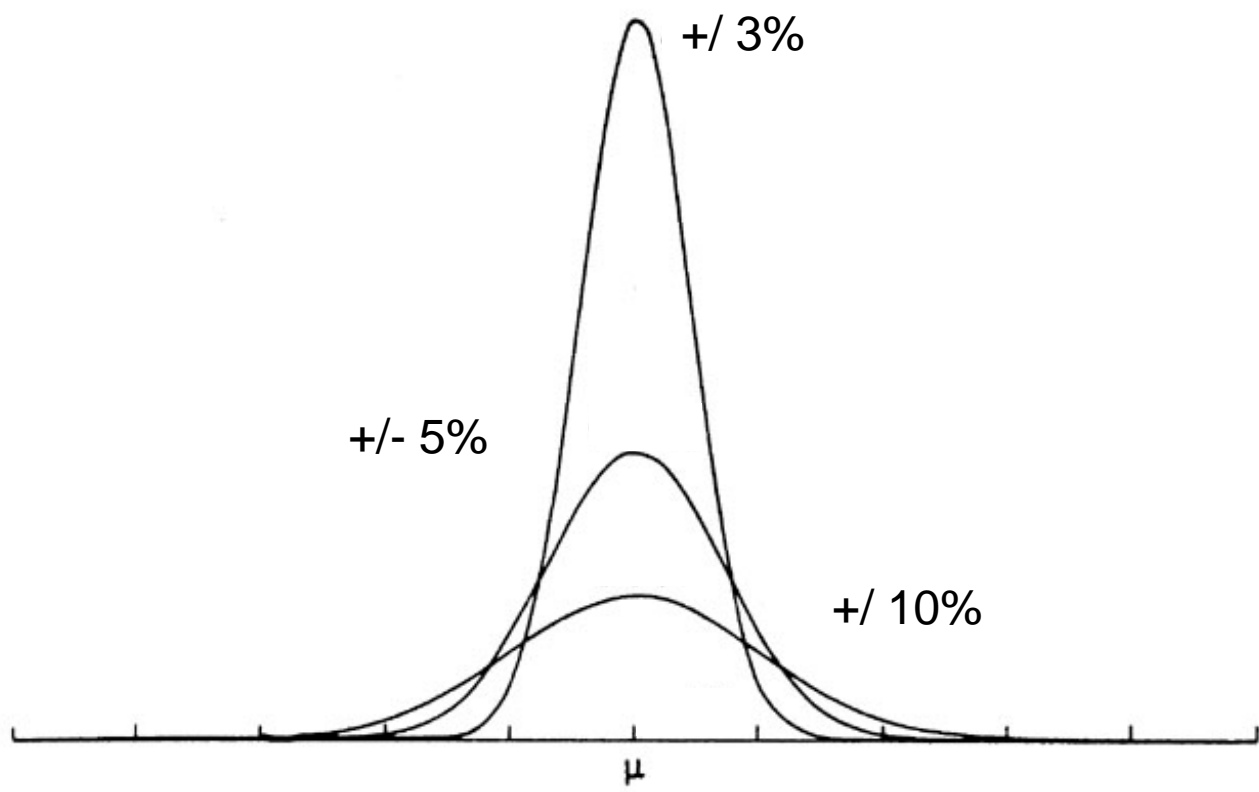
Imp. KOUBIA

A little bit on confidence intervals

Surveys: confidence intervals



Which level of precision would you rather have?



Q. How Precise is Precise Enough?

True coverage is not knowable, but imagine for a moment that after you estimate coverage, a genie appears with an envelope containing the true coverage figure

She reveals that coverage = the upper limit of the 95% CI; you set out to act accordingly

When suddenly...

The genie realizes that she read the results backwards...

True coverage is at the lower limit of the CI!!
What would you do?



Q. How Precise is Precise Enough?

If you would select a different action when you learned that true coverage was at the lower rather than upper limit, then one might say that *your estimate is not precise enough*.



Summing up

... it is the mark of an educated man to look for precision in each class of things just so far as the nature of the subject admits..

Aristotle

Nicomachean Ethics, Chapter 3

The government are very keen on amassing statistics.
They collect them, add them, raise them to the n th power, take the cube root and prepare wonderful diagrams. But you must never forget that every one of these figures comes in the first instance from the chowky dar (village watchman in India), who just puts down what he damn pleases.

Attributed to Josiah Charles Stamp (1880–1941)

When a measure becomes a target, it ceases to be a good measure.

Goodhart's Law, popular form: Goodhart, C.A.E. (1975). "Problems of Monetary Management: The U.K. Experience". *Papers in Monetary Economics* (Reserve Bank of Australia) I.

**The search for evidence to inform policy
may have just gotten easier.**

EVIDENCE

8, OLD POST OFFICE STREET, KOLKATA - 700 001

এভিডেন্স

EVIDENCE

**XEROX
PRINT OUT
AMINATION**