Supplementary Appendix:

Towards universal health coverage in the WHO African Region: Assessing health system functionality, incorporating lessons from COVID-19

Background

This supplement provides additional information to enable persons that would want to replicate the process leading to the results to do so. It highlights how the methods explained in the paper have been implemented using the data, eventually leading to the results. It follows a logical approach from the raw data to the eventual published results.

1

S1. List of countries in the WHO Africa Region by income classifications

High / Upper Middle Income	Lower-middle Income	Low Income
Seychelles (High Income)	Angola	Benin
Algeria	Cameroon	Burkina Faso
Botswana	Cabo Verde	Burundi
Equatorial Guinea	Comoros	Central African Republic
Gabon	Congo, Rep.	Chad
Mauritius	Cote d'Ivoire	Congo, Dem. Rep.
Namibia	Eswatini	Eritrea
South Africa	Ghana	Ethiopia
	Kenya	Gambia, The
	Lesotho	Guinea
	Mauritania	Guinea-Bissau
	Nigeria	Liberia
	Sao Tome and Principe	Madagascar
	Senegal	Malawi
	Zambia	Mali
	Zimbabwe	Mozambique
		Niger
		Rwanda
		Sierra Leone
		South Sudan
		Togo
		Uganda
		United Republic of Tanzania

S2. Notes on constructed index and composite tracer indicators

Health System Functionality Capacity	Vital Signs	Indicator	Data Source	Data Type
Access to Essential Services	Physical Access	Generalist and Specialist Medical Practioners per 1000 population	Global Health Workforce Observatory	Primary Data
		Nursing personnel density /1000 population (including midwives)	Global Health Workforce Observatory	Primary Data
		Health Facility Density	WHO spatial database of health facilities managed by the public health sector in sub-Saharan Africa	Primary Data
		Hospital beds (per 1000 population)	WHO Global Health Observatory\n\nWHO Service Availability and Readiness Assessment Surveys	Primary Data
	Financial Access	Domestic general government health expenditure (% of current health expenditure)	Global Health Expenditure Database	UN Comparable Estimate
		Domestic general government health expenditure (% of general government expenditure)	Global Health Expenditure Database	UN Comparable Estimate
		Out-of-pocket expenditure per capita, PPP (current international $)	Global Health Expenditure Database	UN Comparable Estimate
		Out-of-pocket expenditure (% of current health expenditure)	Global Health Expenditure Database	UN Comparable Estimate
		Incidence of catastrophic expenditure (%): At 10% of household total consumption or income	Global Health Expenditure Database	UN Comparable Estimate
	Sociocultural Access	Secondary education completion rate, female (% of relevant age group)	World Development Indicators –World Bank	UN Comparable Estimate
		Primary education completion rate, female (% of relevant age group)	World Development Indicators –World Bank	UN Comparable Estimate
		Women's Labor Force Participation	The Ibrahim Index of African Governance[1]	Primary Data

3

		Intimate Partner Violence Against Women (%)	Violence Against Women Inter-Agency Group on Estimation and Data	UN Comparable Estimate
Demand for Essential Services	**Healthy Actions**	Antenatal Coverage (% receiving 4+ visits)	DHS World Health Statistics	Primary Data
		Community health workers density (per 1000 population)	Global Health Workforce Observatory	Primary Data
		Total alcohol consumption per capita (liters of pure alcohol, projected estimates, 15+ years of age)	WHO Global Health Observatory	UN Comparable Estimate
		Smoking prevalence, total (ages 15+)	WHO Global Health Observatory	UN Comparable Estimate
	Health Seeking Behaviour	ANC 1 – ANC 4 drop out	DHS WHO Global Health Observatory	Primary Data
		DTP 1 - DTP 3 drop out	WHO AFRO Immunization Database	Primary Data
		DTP3-MCV drop out	WHO AFRO Immunization Database	Primary Data
		Demand for family planning satisfied by modern methods (% of married women with demand for family planning)	WHO Global Health Observatory	UN Comparable Estimate
		Care seeking behavior for child pneumonia	DHS WHO UHC Global Monitoring Report [2]	Primary Data
Quality of Care	**User Experiences**	General Service Readiness (%)	WHO Service Availability and Readiness Assessment Surveys	Primary Data
		Satisfaction with Basic Health Services (%)	The Ibrahim Index of African Governance[1]	Primary Data
	Patient Safety	Standard Precautions for Infection Prevention and Control (%)	WHO Service Availability and Readiness Assessment Surveys	Primary Data
		Still birth rate (per 1000 total births)	WHO Global Health Observatory	Primary Data
	Effectiveness of Interventions	Tuberculosis treatment success rate (% of new cases)	WHO Global Health Observatory	UN Comparable Estimate

4

			Mortality from CVD, cancer, diabetes or CRD between exact ages 30 and 70 (%)	WHO Global Health Observatory	UN Comparable Estimate
			Suicide mortality rate (per 100,000 population)	WHO Global Health Observatory	UN Comparable Estimate
Health Systems Resilience	**General Resilience**	**Awareness**	The County has documented up to date (under 1 year old) mapping of the health system assets – specifically staff, infrastructure, commodities	WHO AFRO Geographic Information System	Primary Data
			The County has documented up to date (under 1 year old) mapping of potential shocks – covering acute and chronic disease, environmental, economic, and political shocks	WHO AFRO Geographic Information System	Primary Data
			The County has a functional surveillance network reporting both weekly on notifiable diseases, and monthly on health system capacity changes	WHO AFRO Geographic Information System	Primary Data
			Simulation exercises have been conducted in the past 1 year, assessing capacity to respond to potential shock events of highest risk of occurrence	WHO AFRO Geographic Information System	Primary Data
			There are agreed standard operating procedures for ensuring functional staff, supplies and infrastructure in the event of a shock event	WHO AFRO Geographic Information System	Primary Data
		Diversity	Health facilities have functional therapeutics committees that are monitoring rare / uncommon events impacting service provision	WHO AFRO Geographic Information System	Primary Data
			There are no stock outs in the past 1 year for common supportive drugs and supplies used in emergency (Oxygen, analgesics, PPEs, and other supportive supplies)	WHO AFRO Geographic Information System	Primary Data
			Health facilities have micro-plans, to take essential services to hard to reach populations in their areas of responsibility	WHO AFRO Geographic Information System	Primary Data
			Health facilities are aware of the range of essential services they are expected to provide, and have plans to expand their capacity to provide these	WHO AFRO Geographic Information System	Primary Data
			Health facilities are utilizing multiple service delivery approaches: fixed sites, outreaches, mobile clinics, e-referrals, etc to take services to their population	WHO AFRO Geographic Information System	Primary Data
		Self-Regulation	The primary care (front line) facilities have the needed epidemiology and other technical skills to identify and isolate health threats	WHO AFRO Geographic Information System	Primary Data

			There are standard operating procedures to allow health facility staff to repurpose their infrastructure, staff and medical supplies when facing potential threats	WHO AFRO Geographic Information System	Primary Data
			There exist processes to guide facilities on how to identify and shield staff, infrastructure and medical supplies for continuing essential services provision during threats	WHO AFRO Geographic Information System	Primary Data
			Mechanisms exist for coordinating additional capacities (staff, infrastructure, medical supplies) mobilized to respond to threats	WHO AFRO Geographic Information System	Primary Data
			Sub County and health facility staff have the required decision space, authority and protocols to initiate action and spend funds in event of shock events	WHO AFRO Geographic Information System	Primary Data
		Mobilization	There are functional mechanisms for communication and engagement with non-public health providers working in the area of responsibility of public facilities – such as private sector, NGOs, CSOs, and others	WHO AFRO Geographic Information System	Primary Data
			There are functional mechanisms for communication and engagement with community groups in the area of responsibility of public facilities	WHO AFRO Geographic Information System	Primary Data
			There are functional mechanisms for communication and engagement with other health related sectors in the area of responsibility of public facilities – such as agriculture, water, security, etc	WHO AFRO Geographic Information System	Primary Data
			There are pre-agreed mechanisms for sharing of personnel, funds and capacities amongst stakeholders working within their areas of responsibility of facilities	WHO AFRO Geographic Information System	Primary Data
			Public, and private sources of additional capacities (staff, infrastructure, medical supplies) for surge capacity are known and procedures to bring these on board are available	WHO AFRO Geographic Information System	Primary Data
		Transformation	There is regularly updated information on the level of functionality of the health system	WHO AFRO Geographic Information System	Primary Data
			There are agreed protocols to guide absorption of resources and skills mobilized during a response to an event into the routine system	WHO AFRO Geographic Information System	Primary Data
			There are protocols to constantly monitor essential service provision during a shock event exist	WHO AFRO Geographic Information System	Primary Data

6

			There is guidance on comprehensive recovery planning based on assessment, and investment across the health system	WHO AFRO Geographic Information System	Primary Data
			Process documentation and intelligence generation is planned for shock events, and a repository of such lessons exists	WHO AFRO Geographic Information System	Primary Data
	IHR Core Capacity Score	**National legislation, policy & financing**	Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR.	WHO e-State Party Annual Reporting tool	Primary Data
			Funding is available and accessible for implementing IHR NFP functions and IHR core capacity strengthening.	WHO e-State Party Annual Reporting tool	Primary Data
		Coordination and NFP communications	A mechanism is established for the coordination of relevant sectors in the implementation of IHR.	WHO e-State Party Annual Reporting tool	Primary Data
			IHR NFP functions and operations are in place as defined by the IHR (2005).	WHO e-State Party Annual Reporting tool	Primary Data
		Surveillance	Indicator based, surveillance includes an early warning3 function for the early detection of a public health event.	WHO e-State Party Annual Reporting tool	Primary Data
			Event based surveillance is established.	WHO e-State Party Annual Reporting tool	Primary Data
		Response	Public health emergency response mechanisms are established.	WHO e-State Party Annual Reporting tool	Primary Data
			Case management procedures are implemented for IHR relevant hazards.	WHO e-State Party Annual Reporting tool	Primary Data
			Infection prevention and control (IPC) is established at national and hospital levels.	WHO e-State Party Annual Reporting tool	Primary Data
			A programme for disinfection, decontamination and vector4 control is established	WHO e-State Party Annual Reporting tool	Primary Data
		Preparedness	A Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed.	WHO e-State Party Annual Reporting tool	Primary Data
			Priority public health risks and resources are mapped	WHO e-State Party Annual Reporting tool	Primary Data
		Risk communication	Mechanisms for effective risk communication during a public health emergency are established.	WHO e-State Party Annual Reporting tool	Primary Data
		Human resource capacity	Human resources available to implement IHR core capacity requirements	WHO e-State Party Annual Reporting tool	Primary Data

		Laboratory	Coordinating mechanism for laboratory services is established.	WHO e-State Party Annual Reporting tool	Primary Data
			Laboratory services are available to test for priority health threats	WHO e-State Party Annual Reporting tool	Primary Data
			Influenza surveillance is established.	WHO e-State Party Annual Reporting tool	Primary Data
			System for collection, packaging and transport of clinical specimens is established	WHO e-State Party Annual Reporting tool	Primary Data
			Laboratory biosafety and laboratory biosecurity (Biorisk management1) practices are in place.	WHO e-State Party Annual Reporting tool	Primary Data
			Laboratory data management and reporting is established	WHO e-State Party Annual Reporting tool	Primary Data
		Points of Entry	General obligations at PoE are fulfilled.	WHO e-State Party Annual Reporting tool	Primary Data
			Coordination in the prevention, detection and response to public health emergencies at PoE is established.	WHO e-State Party Annual Reporting tool	Primary Data
			Effective surveillance and other routine capacities is established2	WHO e-State Party Annual Reporting tool	Primary Data
			Effective response at PoE is established.	WHO e-State Party Annual Reporting tool	Primary Data
		IHR Potential hazard 1: zoonotic events	Mechanisms for detecting and responding to zoonoses and potential zoonoses are established.	WHO e-State Party Annual Reporting tool	Primary Data
		IHR Potential hazard 2: food safety	Mechanisms are established for detecting and responding to foodborne disease and food contamination.	WHO e-State Party Annual Reporting tool	Primary Data
		IHR Potential hazard 3: chemical events	Mechanisms are established for the detection, alert and response to chemical emergencies.	WHO e-State Party Annual Reporting tool	Primary Data
		IHR Potential hazard 4: radiation emergencies	Mechanisms are established for detecting and responding to radiological and nuclear emergencies.	WHO e-State Party Annual Reporting tool	Primary Data

References

8

1. 2018 Ibrahim Index of African Governance [Internet]. The Mo Ibrahim Foundation; Available from: https://mo-s3.ibrahim.foundation/u/2018/11/27173840/2018-Index-Report.pdf

2. Primary Health Care on the Road to Universal Health Coverage MONITORING REPORT [Internet]. World Health Organization; 2019. Available from: https://www.who.int/healthinfo/universal_health_coverage/report/uhc_report_2019.pdf?ua=1

S3. Results of Construct Validity and Sensitivity Analyses

A. Construct validity

Pearson correlation coefficients were calculated to assess the associations between the system functionality Index and the UHC service coverage index as well as health system technical efficiency scores for UHC, where the correlation co-efficient r, was derived by:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$$

Trend Lines Model- UHC Service Coverage and Health System Functionality Scores

Model formula:	(Overall Functionality (Arithmetic) + intercept)
Number of modeled observations:	47
Number of filtered observations:	0
Model degrees of freedom:	2
Residual degrees of freedom (DF):	45
SSE (sum squared error):	2323.66
MSE (mean squared error):	51.6369
R-Squared:	0.7844
Standard error:	7.18588
p-value (significance):	< 0.0001

Trend Lines Model- UHC Technical Efficiency Scores and Health System Functionality Scores

A linear trend model is computed for Shephard Bias-Corrected technical efficiency score given Health System Functionality Scores.

Model formula:	(Health System Functionality Scores + intercept)
Number of modeled observations:	43
Number of filtered observations:	0
Model degrees of freedom:	2
Residual degrees of freedom (DF):	41
SSE (sum squared error):	0.350087
MSE (mean squared error):	0.0085387
R-Squared:	0.6908
Standard error:	0.0924051
p-value (significance):	< 0.0001

Individual trend lines:

Panes		Line		Coefficients				
Row	Column	p-value	DF	Term	Value	StdErr	t-value	p-value
Shephard Bias-Corrected technical efficiency score	Health System Functionality Scores	< 0.0001	41	Health System Functionality Scores	0.00946	0.0015463	6.1178	< 0.0001
				intercept	0.242888	0.08483	2.86324	0.0065791

11

Relationship between System Functionality and Funding Sources

```
. correlate, means
(country_code ignored because string variable)
(country_name ignored because string variable)
(obs=46)
```

Variable	Mean	Std. Dev.	Min	Max
overall_pe~e	53.8212	9.029066	34.39359	75.77888
che_ppp	294.4401	362.1163	37.33223	1485.474
gghe_d_ppp	140.9336	234.5445	3.714186	1085.056
ext_exp_che	.2037603	.1609583	.0002143	.61173
domes_priv~p	123.8236	159.4116	5.537313	719.5785
Vol_health~p	25.76528	76.88444	.2039404	395.7728
oop_exp_CHE	36.1519	21.28976	2.084186	87.66531
other_priv~p	33.54357	80.95197	1.41e-06	402.0437
gghe_d_che	35.06681	18.7632	10.73426	95.97322

	overal~e	che_ppp	gghe_d~p	ext_ex~e	domes_~p	Vol_he~p	oop_ex~E	other_~p	gghe_d~e
overall_pe~e	1.0000								
che_ppp	0.4820	1.0000							
gghe_d_ppp	0.5796	0.9499	1.0000						
ext_exp_che	−0.1664	−0.5316	−0.4670	1.0000					
domes_priv~p	0.1812	0.8608	0.6677	−0.5897	1.0000				
Vol_health~p	0.3402	0.5548	0.4694	−0.3021	0.5540	1.0000			
oop_exp_CHE	−0.5038	−0.2210	−0.2950	−0.0892	0.0040	−0.3558	1.0000		
other_priv~p	0.3430	0.5788	0.4895	−0.3195	0.5725	0.9938	−0.3806	1.0000	
gghe_d_che	0.6037	0.4314	0.5075	−0.2438	0.1944	0.3041	−0.7015	0.3281	1.0000

12

B. Sensitivity Analysis

Correlation coefficients were calculated for each of the methodological changes that were applied to the derived index for testing sensitivity.

Correlation between index computed with arithmetic mean vs geometric mean
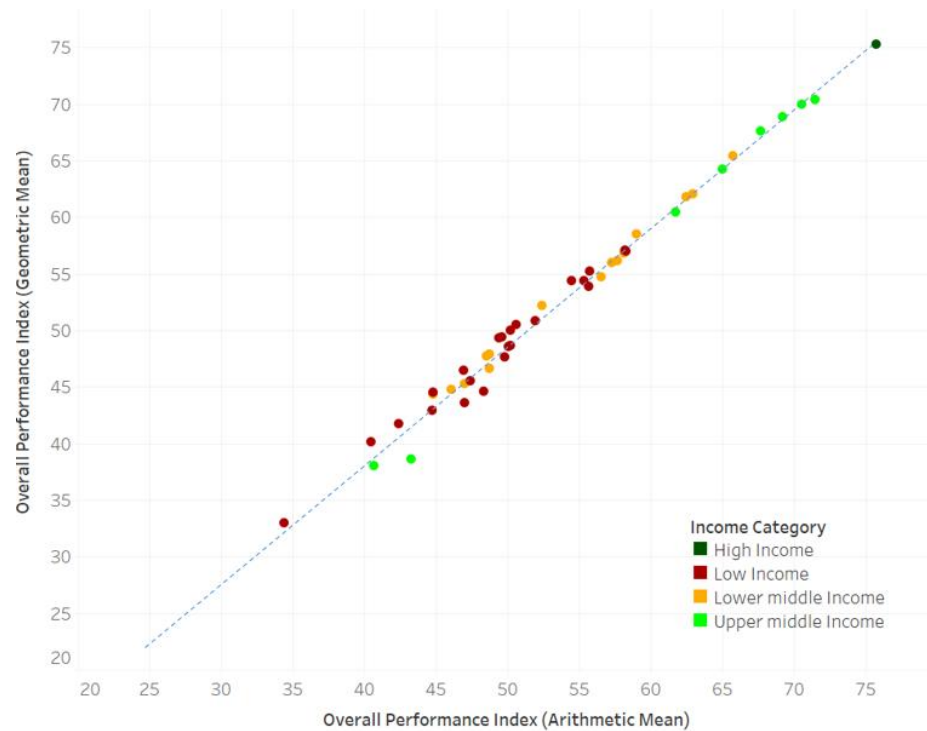
Trend Lines Model

Model formula:	(Overall Functionality (Arithmetic) + intercept)
Number of modeled observations:	47
Number of filtered observations:	0
Model degrees of freedom:	2
Residual degrees of freedom (DF):	45
SSE (sum squared error):	39.33
MSE (mean squared error):	0.873999
R-Squared:	0.990417
Standard error:	0.934879
p-value (significance):	< 0.0001

13

Figure 1: Correlation between rescaled index under alternative index normalization approach vs. original normalization approach (base case)
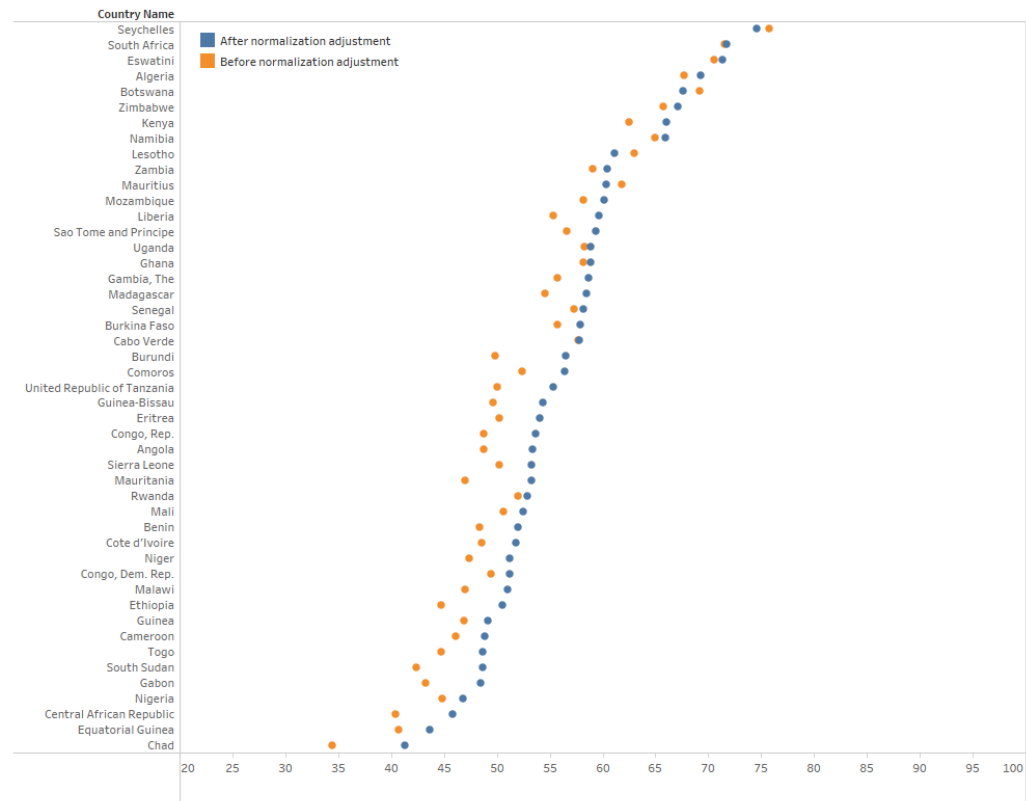
Spearman's Rank correlation coefficient: r=0.971 =, p<0,001

14

Table 1: Spearman rank correlation coefficient matrix of index values when dropping one indicator at a time for calculation of each capacity

Capacity 1: Access

	Original Access Index	Drop Physicians density (per 1000 population)	Drop Nursing and midwifery personnel density (per 1000 population)	Drop Health Facility Density	Drop Hospital beds (per 1000 population)	Drop Domestic general government health expenditure (% of current health expenditure)	Drop Domestic general government health expenditure (% of general government expenditure)	Drop Out-of-pocket expenditure per capita, PPP (current international $)	Drop Out-of-pocket expenditure (% of current health expenditure)	Drop Incidence of catastrophic expenditure (%): At 10% of household total consumption or income	Drop Secondary completion rate, female (% of relevant age group)	Drop Primary completion rate, female (% of relevant age group)	Drop Women's Labor Force Participation	Drop Intimate Partner Violence Against Women (%)
Original Access Index	1.0000													
Drop Physicians density (per 1000 population)	0.9964	1.0000												
Drop Nursing and midwifery personnel density (per 1000 population)	0.9951	0.9943	1.0000											
Drop Health Facility Density	0.9711	0.9697	0.9660	1.0000										
Drop Hospital beds (per 1000 population)	0.9437	0.9367	0.9335	0.9447	1.0000									
Drop Domestic general government health expenditure (% of current health expenditure)	0.9890	0.9876	0.9846	0.9657	0.9124	1.0000								
Drop Domestic general government health expenditure (% of general government expenditure)	0.9947	0.9943	0.9888	0.9581	0.9339	0.9872	1.0000							
Drop Out-of-pocket expenditure per capita, PPP (current international $)	0.9943	0.9919	0.9886	0.9615	0.9385	0.9838	0.9876	1.0000						

Drop Out-of-pocket expenditure (% of current health expenditure)	0.9743	0.9733	0.9721	0.9379	0.8889	0.9794	0.9687	0.9797	1.0000					
Drop Incidence of catastrophic expenditure (%): At 10% of household total consumption or income	0.9850	0.9923	0.9809	0.9625	0.9090	0.9829	0.9816	0.9795	0.9707	1.0000				
Drop Secondary completion rate, female (% of relevant age group)	0.9853	0.9835	0.9849	0.9605	0.9248	0.9698	0.9794	0.9720	0.9496	0.9669	1.0000			
Drop Primary completion rate, female (% of relevant age group)	0.9794	0.9776	0.9793	0.9546	0.9135	0.9669	0.9753	0.9667	0.9457	0.9653	0.9890	1.0000		
Drop Women's Labor Force Participation	0.9794	0.9734	0.9734	0.9512	0.9295	0.9722	0.9706	0.9804	0.9667	0.9706	0.9592	0.9552	1.0000	
Drop Intimate Partner Violence Against Women (%)	0.9762	0.9764	0.9759	0.9529	0.9265	0.9603	0.9696	0.9662	0.9389	0.9731	0.9639	0.9640	0.9433	1.0000

Capacity 2: Demand

	Original Demand Index	Drop Antenatal Coverage (% receiving 4+ visits)	Drop Community health workers density (per 1000 population)	Drop Total alcohol consumption per capita (liters of pure alcohol, projected estimates, 15+ years of age)	Drop Smoking prevalence, total (ages 15+)	Drop ANC 1 – ANC 4 drop out	Drop DTP 1 - DTP 3 drop out	Drop DTP3-MCV drop out	Drop Demand for family planning satisfied by modern methods (% of married women with demand for family planning)	Drop Care seeking behavior for child pneumonia
Original Demand Index	1.0000									

16

Drop Antenatal Coverage (% receiving 4+ visits)	0.9450	1.0000							
Drop Community health workers density (per 1000 population)	0.9616	0.9089	1.0000						
Drop Total alcohol consumption per capita (liters of pure alcohol, projected estimates, 15+ years of age)	0.9476	0.8735	0.9148	1.0000					
Drop Smoking prevalence, total (ages 15+)	0.9593	0.8748	0.9185	0.9388	1.0000				
Drop ANC 1 – ANC 4 drop out	0.9517	0.9531	0.9274	0.8844	0.8899	1.0000			
Drop DTP 1 - DTP 3 drop out	0.9728	0.9139	0.9304	0.9225	0.9073	0.9188	1.0000		
Drop DTP3-MCV drop out	0.9845	0.9102	0.9373	0.9433	0.9492	0.9246	0.9687	1.0000	
Drop Demand for family planning satisfied by modern methods (% of married women with demand for family planning)	0.9228	0.8560	0.8838	0.8439	0.8531	0.8570	0.9049	0.9157	1.0000

17

Supplemental material

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| Drop Care seeking behavior for child pneumonia | 0.9423 | 0.9140 | 0.8745 | 0.8750 | 0.8881 | 0.9008 | 0.9137 | 0.9275 | 0.8802 | 1.0000 |

Capacity 3: Quality

	Original Quality Index	Drop General Service Readiness (%)	Drop Satisfaction with Basic Health Services (%)	Drop Standard Precautions for Infection Prevention and Control (%)	Drop Still birth rate (per 1000 total births)	Drop Tuberculosis treatment success rate (% of new cases)	Drop Mortality from CVD, cancer, diabetes or CRD between exact ages 30 and 70 (%)	Drop Suicide mortality rate (per 100,000 population)
Original Quality Index	1.0000							
Drop General Service Readiness (%)	0.9602	1.0000						
Drop Satisfaction with Basic Health Services (%)	0.9201	0.8586	1.0000					
Drop Standard Precautions for Infection Prevention and Control (%)	0.9401	0.9606	0.8389	1.0000				
Drop Still birth rate (per 1000 total births)	0.8708	0.8358	0.7369	0.8201	1.0000			

18

Drop Tuberculosis treatment success rate (% of new cases)	0.9422	0.8970	0.8785	0.8778	0.8301	1.0000	
Drop Mortality from CVD, cancer, diabetes or CRD between exact ages 30 and 70 (%)	0.8974	0.8408	0.7668	0.8042	0.7706	0.7919	1.0000
Drop Suicide mortality rate (per 100,000 population)	0.9198	0.8602	0.8173	0.8466	0.7061	0.8437	0.8920	1.0000

Capacity 3: Resilience

	Original Resilience Index	drop awareness_score	drop diversity_score	drop self-regulation_score	drop mobilisationt_score	drop transformation_score
Original Resilience Index	1.0000					
drop awareness_score	0.9557	1.0000				
drop diversity_score	0.9725	0.9574	1.0000			
drop self-regulation_score	0.9642	0.8645	0.9092	1.0000		
drop mobilisation_score	0.6467	0.5955	0.6050	0.6265	1.0000	

Principal Component Analysis- Components and Eigenvectors

```
Principal components/correlation              Number of obs    =        47
                                              Number of comp.  =        34
                                              Trace            =        34
     Rotation: (unrotated = principal)        Rho              =    1.0000
```

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	6.78768	2.4683	0.1996	0.1996
Comp2	4.31938	1.3679	0.1270	0.3267
Comp3	2.95148	.176408	0.0868	0.4135
Comp4	2.77507	.434901	0.0816	0.4951
Comp5	2.34017	.337966	0.0688	0.5639
Comp6	2.0022	.275448	0.0589	0.6228
Comp7	1.72676	.283114	0.0508	0.6736
Comp8	1.44364	.190398	0.0425	0.7161
Comp9	1.25324	.0851438	0.0369	0.7529
Comp10	1.1681	.215858	0.0344	0.7873
Comp11	.952243	.0365186	0.0280	0.8153
Comp12	.915724	.135374	0.0269	0.8422
Comp13	.78035	.113981	0.0230	0.8652
Comp14	.666369	.0441545	0.0196	0.8848
Comp15	.622215	.137601	0.0183	0.9031
Comp16	.484614	.0625038	0.0143	0.9173
Comp17	.42211	.0539185	0.0124	0.9297
Comp18	.368192	.0359836	0.0108	0.9406
Comp19	.332208	.0467717	0.0098	0.9503
Comp20	.285437	.0064869	0.0084	0.9587
Comp21	.27895	.0772345	0.0082	0.9669
Comp22	.201715	.0172967	0.0059	0.9729
Comp23	.184419	.0113126	0.0054	0.9783
Comp24	.173106	.0223631	0.0051	0.9834
Comp25	.150743	.016953	0.0044	0.9878
Comp26	.13379	.0645462	0.0039	0.9918
Comp27	.0692438	.00442925	0.0020	0.9938
Comp28	.0648145	.0130981	0.0019	0.9957
Comp29	.0517164	.0135425	0.0015	0.9972
Comp30	.0381739	.0105229	0.0011	0.9983
Comp31	.027651	.0108764	0.0008	0.9992
Comp32	.0167746	.0100998	0.0005	0.9997
Comp33	.00667481	.00164198	0.0002	0.9999
Comp34	.00503283	.	0.0001	1.0000

Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9
gen_prac_d~s	0.2615	−0.0915	0.0841	−0.0929	0.1543	−0.1502	0.2515	−0.1296	−0.0461
nurse_dens	0.3124	−0.0062	−0.0990	0.0495	0.0107	−0.0866	0.1838	−0.2023	−0.0547
fac_dens	0.1479	−0.1311	0.0553	0.0648	0.0762	0.4444	0.0945	−0.0389	0.1659
bed_dens	0.0807	−0.1166	0.0537	−0.1071	0.2372	0.1045	−0.3054	0.1874	0.1725
dom_gen_gov	0.2955	0.0759	−0.0083	0.1696	−0.1824	0.0546	0.1224	0.0080	0.0377
dom_gene_g~e	0.0436	0.0535	0.2250	−0.3913	0.1144	−0.1666	−0.0144	−0.0434	0.0573
oop_ppp	−0.0577	0.3427	0.1694	0.1734	−0.0171	−0.0612	0.0279	−0.0445	0.3117
oop_che	0.2149	0.2317	0.0697	0.2790	−0.1886	0.1036	−0.0716	0.1259	0.0555
cata_10	0.0936	0.2703	0.1851	0.2442	−0.0047	−0.0421	0.0042	−0.0245	−0.1054
fem_sec_comp	0.3206	−0.0428	0.0929	−0.1153	0.1684	0.0157	0.0176	0.0355	0.0196
fem_pri_comp	0.3054	0.0385	0.1131	−0.0694	0.0902	−0.0102	−0.1011	0.0670	0.1122
lab_force	−0.0899	0.0804	0.0635	0.4195	−0.1495	−0.0633	−0.1718	−0.0259	−0.1513
ipv	0.1060	0.0720	−0.0976	−0.0621	0.3028	−0.1501	0.3539	−0.0315	0.1171
anc_cov	0.2866	−0.1215	0.0092	−0.1200	−0.0515	−0.1078	−0.0041	0.2827	−0.0717
chw	0.1408	0.0491	−0.2316	−0.0165	−0.2137	0.0077	−0.1634	−0.1048	0.5221
alc	−0.1635	0.1066	0.1941	0.0291	0.1855	−0.3674	−0.0930	0.0454	0.1281
smoke_prev	−0.1274	0.0229	0.0433	−0.0311	0.1953	0.3300	0.0435	0.2208	0.4167
anc_drop	0.1785	−0.2841	−0.1381	0.0476	−0.0901	−0.0098	−0.0051	0.2816	−0.1640
dtp_drop	0.1953	0.1938	0.1767	−0.0187	0.0941	−0.0502	−0.0914	−0.1687	0.0612
dtp_mcv_drop	−0.0316	0.1061	−0.0668	0.2977	0.3423	0.1001	0.1056	0.1303	−0.2603
fp	0.1632	0.2105	0.1033	−0.0594	0.0039	0.1709	−0.3863	0.0057	−0.0654
chi_pneu	0.2247	0.0193	0.1298	0.0513	0.0300	−0.2229	−0.0847	0.2734	−0.1025
gsr	0.1047	−0.0230	−0.2169	0.2451	0.1567	−0.0967	−0.1051	−0.0781	0.2260
sat_health	0.1392	0.0762	−0.1460	0.0901	0.0712	−0.0393	0.1529	−0.5144	0.0146
ipc	−0.0170	0.1501	−0.0894	0.0720	−0.1326	−0.4064	0.2011	0.4026	0.2183
still_birth	0.3085	0.0055	0.1158	−0.0049	−0.0791	0.0349	−0.1501	−0.0160	−0.0921
tb_treat	−0.0740	0.1113	−0.0371	−0.0489	0.3582	−0.1700	−0.4227	−0.1505	−0.1336
mort_canc	−0.0069	0.0114	0.4567	−0.0105	−0.0630	0.2282	0.1166	−0.0674	−0.0965
suic	−0.1091	0.1083	0.4027	0.0466	0.1100	0.0794	0.3128	0.1260	0.0365
aware	0.0298	−0.0645	−0.1341	0.2614	0.4221	0.0515	−0.0204	0.0888	0.0044
div	0.0638	0.1519	−0.2429	0.0838	0.2033	0.1866	0.0626	0.1911	−0.0934
self_regul~n	0.0178	0.3901	−0.1840	−0.2024	−0.0807	0.0406	0.0228	0.0782	−0.1304
mobilization	0.0236	0.3658	−0.1896	−0.2249	−0.0288	0.1362	0.0399	0.0769	−0.1525
transfrom	−0.0246	0.3513	−0.1988	−0.2588	0.0245	0.1356	0.0850	0.0637	−0.0776

20