

Supplementary Table 1. All iNTS organisms analysed

All iNTS isolates from TSAP <sup>2</sup> & non-TSAP projects <sup>3</sup> in Ghana (N=166)								
iNTS isolates analyzed <sup>1</sup> (N=945)	Burkina Faso	Ghana <sup>4</sup>	Guinea-Bissau	Kenya	Madagascar	Senegal	South Africa	Tanzania
	12	133	9	1	4	2	1	4
	4 (Polesgo)	84 (Asante Akim North)	6 (Simao Hospital)	1 (Kibera)	3 (CHU Tsaralalana)	1 (IPS)		2 (Moshi Urban)
	8 (Niokoll)	49 (Agogo) <sup>5</sup>	2 (Bandim)		1 (Isotry)	1 (Dominique hospital)		1 (Moshi Rural)
		36 ("IsolateAgogo")	1 (Belem)					1 (Moshi Other)
		5 ("FISA")						
		3 ("TYSA")						
		5 (unidentified)						
Published iNTS Typhimurium ST313 isolates (N=147) <sup>6</sup>								
	DRC <sup>7</sup>	Kenya	Malawi	Mali	Mozambique	Nigeria	Uganda	
	14	15	73	18	11	6	10	
Published iNTS Enteritidis ST11 isolates (N=677) <sup>8</sup>								
	Western Africa	Central & Eastern Africa	Southern Africa	Northern Africa	Rest of the World			
	90	262	131	11	183			

<sup>1</sup> Total 907 iNTS organisms were analysed in this manuscript: 166 iNTS isolates from the TSAP and other Ghana projects; sequenced and published 147 iNTS serovar typhimurium ST313 isolates from seven countries (DRC/Kenya/Malawi/Mali/Mozambique/Nigeria/Uganda); and sequenced and published 594 (out of 677) iNTS serovar Enteritidis ST11 isolates (See appendices for the metadata).

<sup>2</sup> TSAP: Typhoid Fever Surveillance Program (Von Kalkreuth *et al.* 2016; Marks *et al.* 2017). Of the ten countries under the TSAP, no iNTS was found in Sudan and Ethiopia. 4 and 1 iNTS strains were identified from Madagascar and South Africa, respectively, through the whole genome sequencing; no iNTS isolates were reported from Madagascar and South Africa based on the blood culture result. Few analysed iNTS isolates, which may have been detected outside the strictly predefined surveillance catchment area, are considered for the bacterial genomic analysis, but excluded from the incidence estimation of the multidrug resistant iNTS in respective sites in Table 4. The 166 iNTS isolates included for the final genomic analyses are based on the screening of whole genome sequenced results.

<sup>3</sup> Non-TSAP projects in Ghana include the "Febrile Illnesses Surveillance in Africa (FISA)", "Typhoid Surveillance in Africa (TYSA)", and "IsolateAgogo" conducted in Agogo.

<sup>4</sup> Ghana: 133 iNTS isolates analysed in this manuscript include 84 iNTS detected through the TSAP in Asante Akim North and 49 iNTS from several non-TSAP projects conducted in Agogo.

<sup>5</sup> 49 (Agogo): 49 iNTS isolates detected from various non-TSAP projects in Agogo, Ghana as listed in this table.

<sup>6</sup> Total 147 iNTS Typhimurium ST313 isolates, which had been collected in seven countries in sub-Saharan Africa and whole genome sequenced, were published and raw sequence data accessible at the Wellcome Trust Sanger Institute. Global collection of *S. Typhimurium* and additional *S. Typhimurium* from: Malawi, Kenya, Mozambique, Uganda, DRC, Nigeria, and Mali (Okoro *et al.* 2012); Nigeria and DRC (Leekitcharoenphon *et al.* 2013); Malawi (Feasey *et al.* 2014); Kenya (Kariuki *et al.* 2015b); Malawi (Msefula *et al.* 2012). Whole genome sequenced 166 iNTS isolates from TSAP and non-TSAP projects in Ghana listed in this table included 99 iNTS Typhimurium ST313. This 99 ST313 was combined with the raw sequence data of 147 ST313 published isolates listed in this footnote. Total 246 ST313 isolates were further analysed.

<sup>7</sup> DRC: Democratic Republic of Congo

<sup>8</sup> Raw sequence data of the published global collection of 594/677 *S. Enteritidis* isolated from human and animal samples (Feasey *et al.* 2016) were accessible at the Wellcome Trust Sanger Institute. The associated metadata were publicly available online. These samples were collected and whole genome sequenced across the African continent and the world:

- Western Africa: Benin, Cameroon, Chad, Gabon, Guinea, Ivory Coast, Mali, Niger, and Senegal
- Central & Eastern Africa: Central African Republic, Comoros, Congo, Djibouti, Ethiopia, HPA, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, and Uganda
- Southern Africa: Republic of South Africa
- Northern Africa: Algeria, Egypt, Mauritania, Morocco, and Tunisia
- Rest of the World: Angola, Argentina, Columbia, Germany, Italy, Japan, PTG, Ratin-manufactured rat poison, Slovakia, Spain, Thailand, UK, Uruguay, USA, and unknown