O0733

Deriving a novel method to calculate AMU for policy interventions for antibiotics without a WHO DDD

11. Other

11d. Digital health and infection (incl AI, data mining, informatics)

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Background

Global and national policy decisions on the effective use of antimicrobials cannot be made without metrics on their usage. The World Health Organization's (WHO) concept of Defined Daily Dose (DDD) provides a denominator for calculating Antimicrobial Usage (AMU) but has two shortcomings: 1) the WHO does not cover the full range of drugs and administration routes found in source data; 2) the methodology for calculating DDD for fixed-dose combinations (FDC) ignores the strengths of the component drugs, producing a DDD not appropriate for calculating AMU. We have devised a methodology for calculating AMU for the data falling into these two categories, along with a database of denominators when a WHO denominator is not available.

Methods

The ADILA project collects secondary data from multiple sources (typically weights/country/year/drug/route of administration) and uses the WHO's DDD as a denominator to calculate AMU. A typical calculation of AMU takes the reported weight of drug and divides it by the DDD. However, much of these data fall into problem categories as above. We categorised the drugs reported in the source data and created a decision tree (figures 2-3) to determine how these categories should be reported and where to source their DDD denominator. We undertook internet searches to determine recommended doses as a denominator for those source data without a WHO DDD denominator. For FDC drugs, we used the drug strengths and ratio of those strengths in the internet search for recommended doses.

Results

Figure 1 shows a breakdown of the numbers of data points for which we were able to calculate AMU, broken down by route of administration (for single and fixed-dose antimicrobials) and then by calculation method. AMU could be calculated using the WHO DDD method for >92% of data points. 64% of the remaining were able to have AMU calculated using the ADILA method.

Conclusions

Our methodology provides a defendable approach for calculating AMU for drugs administered by most routes (except transdermal) lacking a WHO DDD denominator, and for calculating AMU for FDC drugs.

Breakdown of data points by AMU calculation method

Single Antimicrobials			
	Data points for which AMU can be		Data points for which
Route Of Administration	Number of data points	Percentage of data points	Number of data points
Inhal	339	31.51%	737
Inhal.powder	791	72.04%	307
Inhal.solution	2,056	98.47%	32
Instill	0	0.00%	511
Oral	678,589	99.12%	5,999
Parenteral	281,121	99.47%	1,507
Rectal	436	84.99%	77
Sublingual/Buccal/Oromucosal	0	0.00%	1,248
Transdermal	0	0.00%	52,825
Unknown	0	0.00%	81
Vaginal	0	0.00%	500

Fixed Dose Combinations			
	Data points for which AMU can be		Data points for which
Route Of Administration	Number of data points	Percentage of data points	Number of data points
Instill	0	0.00%	16,306
Oral	42,248	70.57%	17,617
Parenteral	2,316	68.85%	1,048
Sublingual/Buccal/Oromucosal	0	0.00%	2,663
Transdermal	0	0.00%	23,968
Unknown	0	0.00%	122
Vaginal	0	0.00%	7,447

By Calculation Method		
AMU Caculation Method		Total Data Points
AMU calculated using the ADILA method		64,066
AMU Cannot be calculated		35,902
Single antimicrobial with WHO DDD denominator		1,160,583
	Total	1,260,551

Decision tree for single antimicrobials

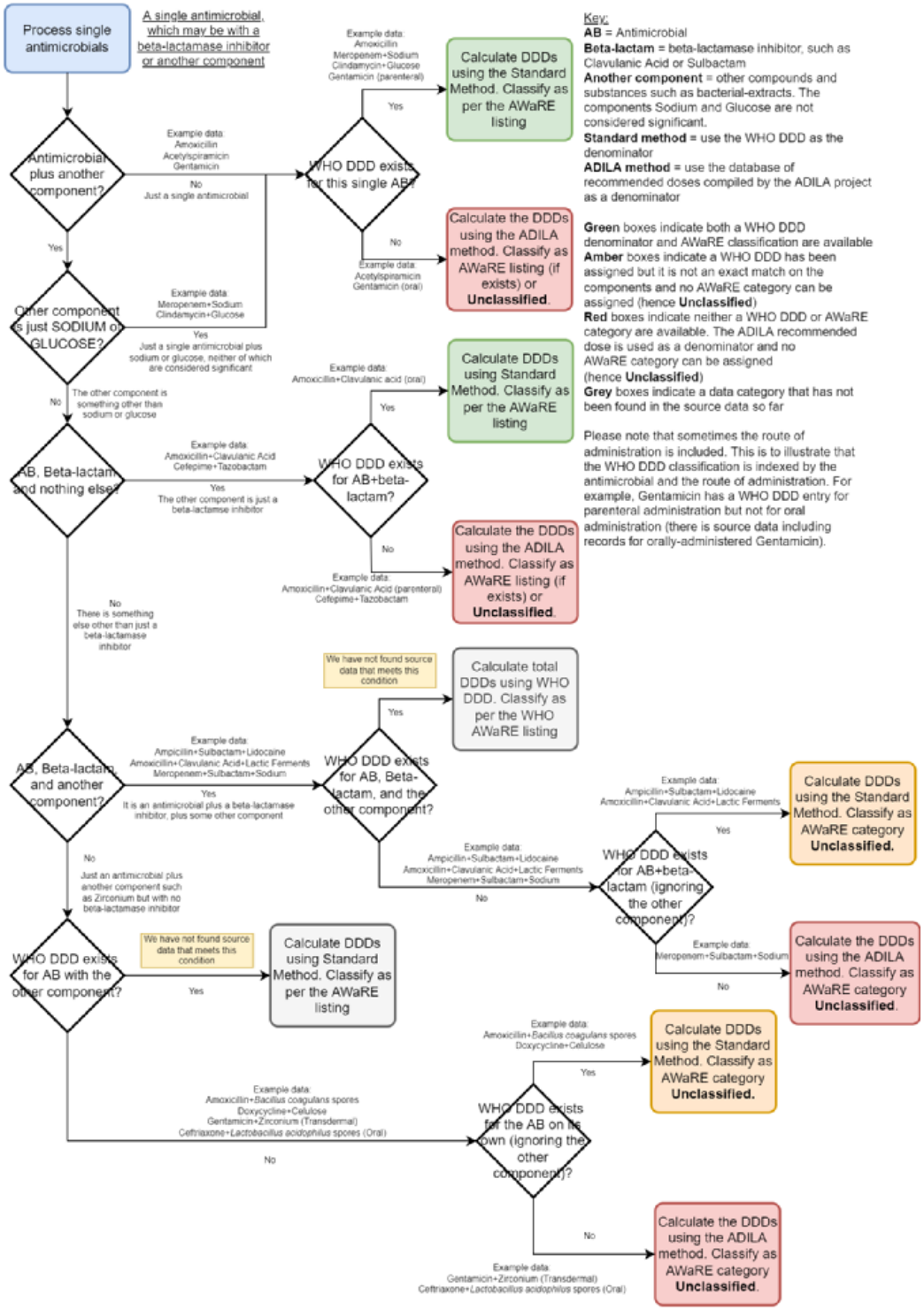

Figure 2: Processing Single Antimicrobials

Decision tree for fixed-dose combination antimicrobials

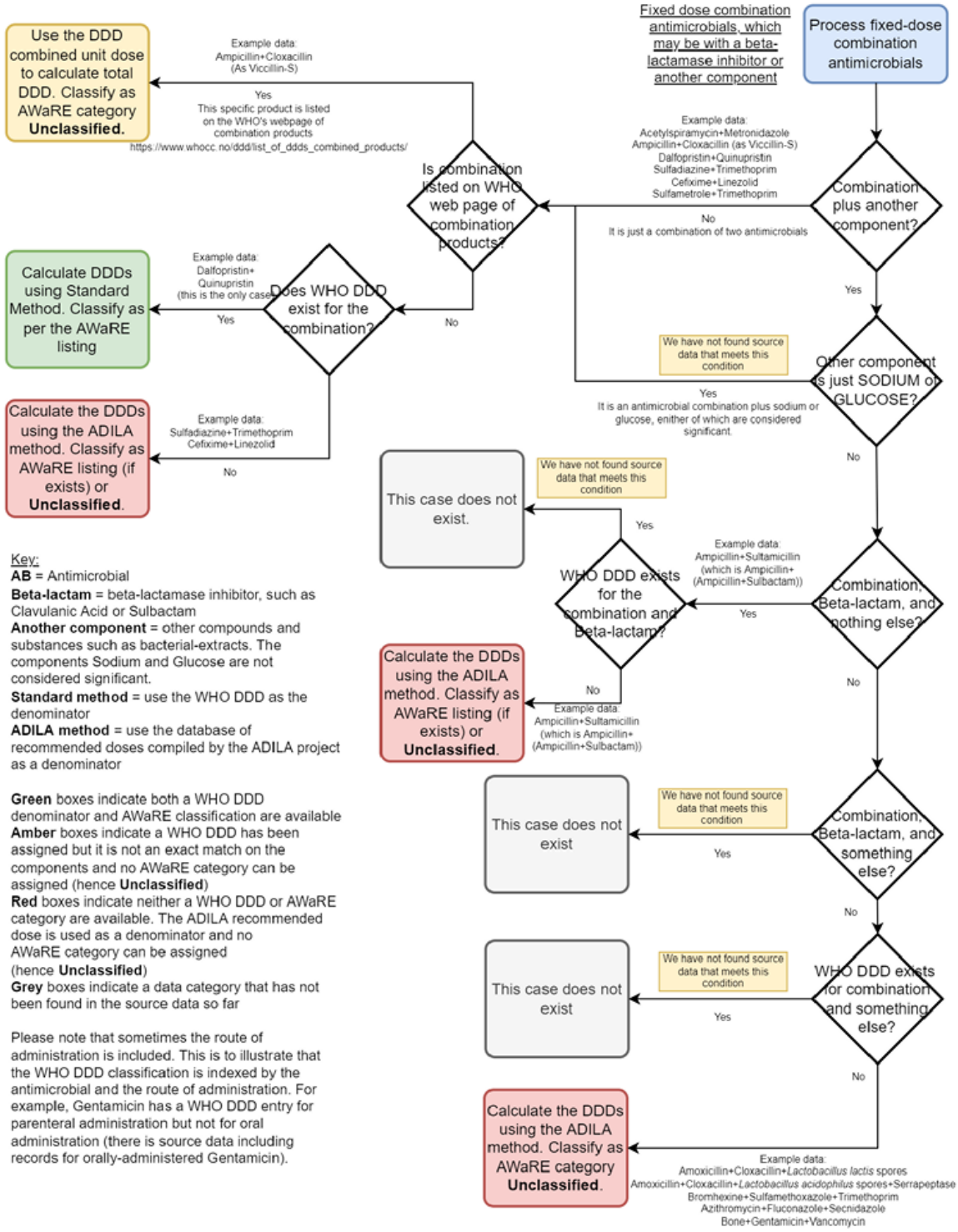

Figure 3: Processing Fixed-Dose Combination Antimicrobials