

Evaluating a Novel Antibigram Format for Use in Wisconsin Nursing



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Question | Can a WISCA be an alternative anti-biogram format in nursing homes?

Nursing homes increasingly use antibiograms to track antibiotic-related outcomes and guide antibiotic choice. Creation of a facility-specific antibiogram is hampered by low number of cultures collected in NHs. A weighted-incidence syndromic combination antibiogram (WISCA) is an alternative approach that may provide more stable estimates of antibiotic activity. In this study, we compare traditional antibiograms and WISCAs in a sample of Wisconsin NHs.

A. Examples of traditional antibiogram and WISCA for nursing home XX

Nursing Home XX Traditional Urinary Antibigram		% sensitivity to antibiotics						
		Amoxicillin	Cephalexin	Ceftriaxone	Ertapenem	Nitrofurantoin	Ciprofloxacin	TMP-Sulfa
Isolate species	# of isolates							
E. coli	19	63	74	79	95	74	63	84
Enterococcus spp.	11	91	0	0	0	73	73	82
Klebsiella spp.	8	50	50	75	100	63	75	75
Proteus spp.	7	71	71	100	100	0	57	86

Nursing Home XX WISCA (total urinary isolates = 45)	
Empiric antibiotic regimen	% of urinary pathogens susceptible
Amoxicillin	65
Cephalexin	47
Ceftriaxone	57
Ertapenem	68
Nitrofurantoin	60
Ciprofloxacin	65
TMP-Sulfa	77

Methods | Create and evaluate two antibiogram formats for use in nursing homes.

We created urine-specific antibiograms using traditional and WISCA approaches at the facility and regional levels from culture data collected from study nursing homes between 1/1/2018 - 12/31/2018. Susceptibility results were standardized across laboratories using CLSI breakpoints. Each tool was deemed reliable based on the criteria below. Bootstrapped regional mean susceptibilities and confidence intervals were calculated. We performed concordance analysis between facility mean susceptibilities and bootstrapped mean susceptibilities, as below.

B. Reliability Criteria

Traditional Antibiogram	WISCA
• >20 isolates per species • Included isolates represent 75% of all culture results	• >20 isolates per tool

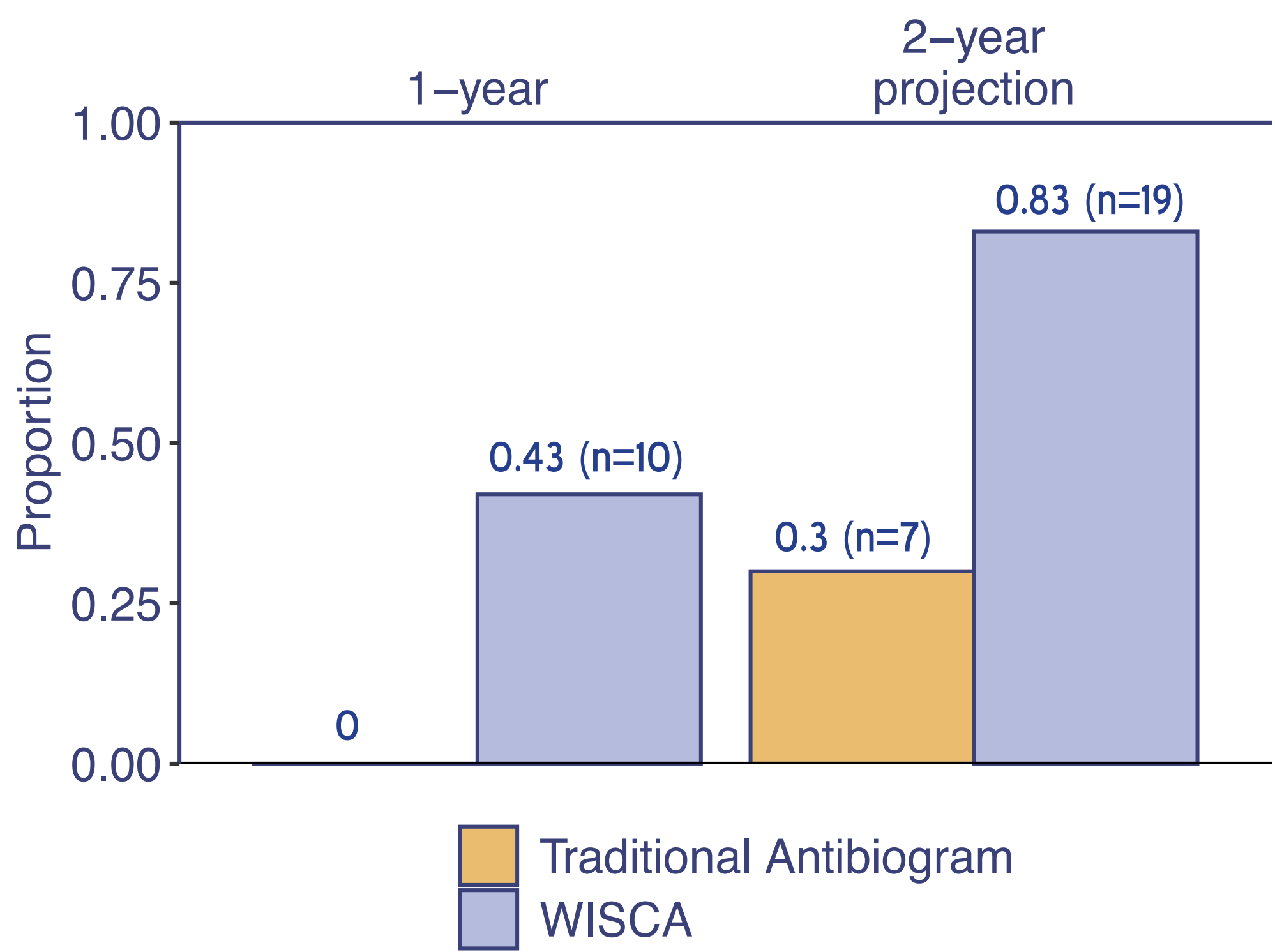
C. Concordance Criteria

Relationship of NH mean to bootstrap regional mean susceptibility	Concordant	Moderately Discordant	Severely Discordant
	Within 1 SD	Between 1 & 2 SD	Greater than 2 SDs

Results

- None of the facility-specific traditional antibiograms met reliability criteria, whereas nearly half of facility-specific WISCAs met reliability criteria.
- Expanding culture data to 2-years doubled the number of facility specific WISCAs.
- The majority of facility-specific and boot-strapped regional mean susceptibilities were discordant.

D. Reliability analysis results.



E. Concordance analysis results.



WISCAs are more reliable than traditional antibiograms for estimating antibiotic susceptibilities using facility-specific data.

The high degree of discordance observed between facility-specific and regional antibiograms raises concerns about pooling culture data regionally.