



# Predictors of career interest in infectious diseases among US pharmacy students



Meghan Jeffres, PharmD • Lauren Biehle, PharmD, BCPS • Conan MacDougall, PharmD, MAS, BCPS  
 University of Colorado Skaggs School of Pharmacy • University of Wyoming School of Pharmacy • University of California San Francisco School of Pharmacy

## BACKGROUND

The importance of pharmacists to antimicrobial stewardship (AS) programs is recognized by the Joint Commission, Center for Medicare and Medicaid Services, the Centers for Disease Control and Prevention, and the Society for Healthcare Epidemiology of America.

In addition to the critical role of a pharmacist who practices in antimicrobial stewardship in the acute care setting, there is also an important role for graduates who will practice in the outpatient setting. The majority of pharmacy graduates will work in a community pharmacy and can play a role in decreasing unnecessary antimicrobials through point-of-care testing for common infections, management of non-infectious or viral syndromes, and triage to higher levels of care.

The growing need for clinicians trained in the optimal use of antimicrobials has resulted in an examination of educational practices.

## OBJECTIVE

To compare students' perceptions of their school's ID curriculum between students interested in an ID career and those who are not.

## METHODS

**Design and subjects:** Cross-sectional survey of students graduating in 2018 from ACPE accredited pharmacy schools in the US.

**Procedure:** ID faculty at all pharmacy schools were invited to participate. The survey link was sent to faculty who then distributed the link to graduating pharmacy students.

**Survey:** 15 questions collecting qualitative and quantitative data

**Analysis:** A Chi square analysis was used to compare categorical data. Multivariate conditional logistic regression analyses were performed using the outcome of a career interest in ID as the primary outcome.

## RESULTS

### CAREER INTEREST

All Students	N=587
Career interest	
Ambulatory care	44%
Community pharmacy practice	39%
Infectious diseases	29%
Critical care	23%
Inpatient internal medicine	20%
Emergency medicine	16%
Oncology	15%
Pediatrics	12%
Psychiatric	12%
Cardiology	10%
Positive career interest influence	
Pharmacy school curriculum	69%
Personal experience(s)	66%
Faculty member(s) or mentor(s)	56%
Employment experience(s)	56%
Patient encounter(s)	50%
Influence of didactic pharmacy education	
Very influential	28%
Somewhat influential	56%
Not influential	17%

ID Career Interest	N=157
Practice area	
Inpatient	87%
Inpatient stewardship	71%
Inpatient ID consult service	67%
Academia	36%
Outpatient ID consult service	34%
Outpatient stewardship	34%
Outpatient ID clinic	32%
Global health	29%
HIV/AIDS	19%
Immunocompromised/SOT	19%

### COMPARATIVE ANALYSIS

	ID career interest, n=157	Other career interest, n=380	P value
Quality of didactic ID education			
Very Good	52%	36%	<0.01
Good	36%	43%	NS
Acceptable	8%	17%	<0.01
Poor	4%	4%	NS
Topics deserving more curricular time			
Antibiotic stewardship	47%	31%	<0.01
Rapid diagnostics	31%	23%	0.05
Selecting appropriate empiric therapy	35%	44%	0.06
Disease specific therapeutics	32%	40%	0.08

	ID career interest, n=157	Other career interest, n=380	P value
Timing of career interest area			
Before pharmacy school	12%	27%	<0.01
During/after an experiential rotation	40%	39%	NS
During/after a topic taught	39%	21%	<0.01
Positive career influences			
Curriculum K-12	12%	20%	0.03
Curriculum in undergrad	27%	29%	0.67
Curriculum in pharmacy school	81%	64%	<0.01
Employment experience	46%	60%	<0.01
Faculty member(s) or mentor(s)	68%	52%	<0.01
Patient encounters	50%	51%	0.92
Peer influence	15%	17%	0.70
Personal experience(s)	60%	68%	0.06
Pharmacy didactic education			
Very influential	39%	23%	<0.01
Somewhat influential	50%	58%	NS
Not influential	12%	19%	<0.01

### LOGISTIC REGRESSION FOR ID CAREER INTEREST

	Univariate OR (95% CI)	Multivariate OR (95% CI)
Quality of didactic ID education "Very Good"	1.8 (1.3 – 2.7)	1.5 (1.0 – 2.3)
Faculty provided handouts or worksheets during ID didactic curriculum	1.9 (1.1 – 3.4)	1.9 (1.1 – 3.6)
Pharmacy school curriculum	2.4 (1.5 – 3.7)	2.5 (1.5 – 4.0)
Faculty mentor(s)	2.0 (1.3 – 2.9)	1.8 (1.2 – 2.7)

## DISCUSSION

These results are important given pharmacists' key role in promoting appropriate antimicrobial use and limited availability of postgraduate training in ID for pharmacy graduates. Because postgraduate training is not required in pharmacy, most pharmacists will participate in antimicrobial stewardship supported primarily by their education received in pharmacy school. The cohort of graduating students surveyed in this study appeared aware of the need for knowledge and skills in ID/AS. The top three topics identified as needing more time in their didactic ID education are all fundamental stewardship skills (intravenous to oral antimicrobial transition, biological markers, and de-escalation, streamlining, or narrowing spectrum of antimicrobials).

Our results mirror the findings of a medical resident study. Bonura et al. found that residents who indicated an interest in ID at the end of residency were more likely to rate their medical school curricula as Very Good (53%), compared with only 33% of those never interested in ID. Additionally residents who experienced case-based learning and nonmemorization learning had an increased likelihood of choosing ID (relative risk ratio, 3.7-3.9).

In conclusion, our study of graduating pharmacy students discovered that the perceived quality of didactic ID education was positively associated with a career interest in ID and/or AS. Thus, an engaging and creative didactic ID curriculum has potential to increase interest in ID/AS careers among pharmacy students.