

# Trends in Admissions, Attrition, Dismissals, and Board Performance for Pharmacy Students between 2012 and 2022

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## BACKGROUND

The first time NAPLEX pass rate is regarded as an important attribute of a student pharmacist (outcome) and of the quality of the Pharm.D. program (output). For over a decade, the NAPLEX performance of pharmacy graduates has continued to decline. Pharmacy educators have studied different factors that could contribute to these decreasing NAPLEX scores. In this project, an attempt was made to explore multiple interrelated elements within the input-output model of pharmacy education in context of the NAPLEX scores.

## OBJECTIVE

To compare trends and changes in admissions, attrition, dismissals, and performance on licensing board exams by students from pharmacy and other health professional programs from 2012 to 2022.

## METHODS

- Information was compiled from research articles and official reports published by professional organizations and accrediting agencies.
- For pharmacy programs, data included PharmCAS, attrition, dismissal, and NAPLEX first-time pass rates.
- For nursing, dentistry, physician assistant (PA), physical therapy (PT), allopathic and osteopathic medicine (MD, DO), and veterinary medicine, the exam first-time pass rates were collected.
- The board performance was compared between these eight programs. For pharmacy, additional comparisons were made between trends in NAPLEX first-time pass rates and data on admission, attrition, and dismissal.

## RESULTS

- From 2012 to 2022, the PharmCAS applicant acceptance increased from 69.5% to 86.5%.
- The year over year acceptance of PharmCAS applicants changed from 21.5% in 2008-2009 to 0.2% in 2018-2019.
- The applicant volume decreased by 36.3% between 2012 and 2022.
- Between 2012 and 2021, student attrition and withdrawal rates increased from 2% to 0.5%.
- The 10-year average NAPLEX first-time pass rate decreased by 17% while it fluctuated between 4% and 9% in other programs.
- The 10-year average first-time pass rate for dentistry, PA, PT, DO and MD programs was 92, 95, 91, 96, and 97%, respectively.

## RESULTS (cont.)

Figure 1: Number of PharmCAS Applicants Accepted from 2012 to 2022.

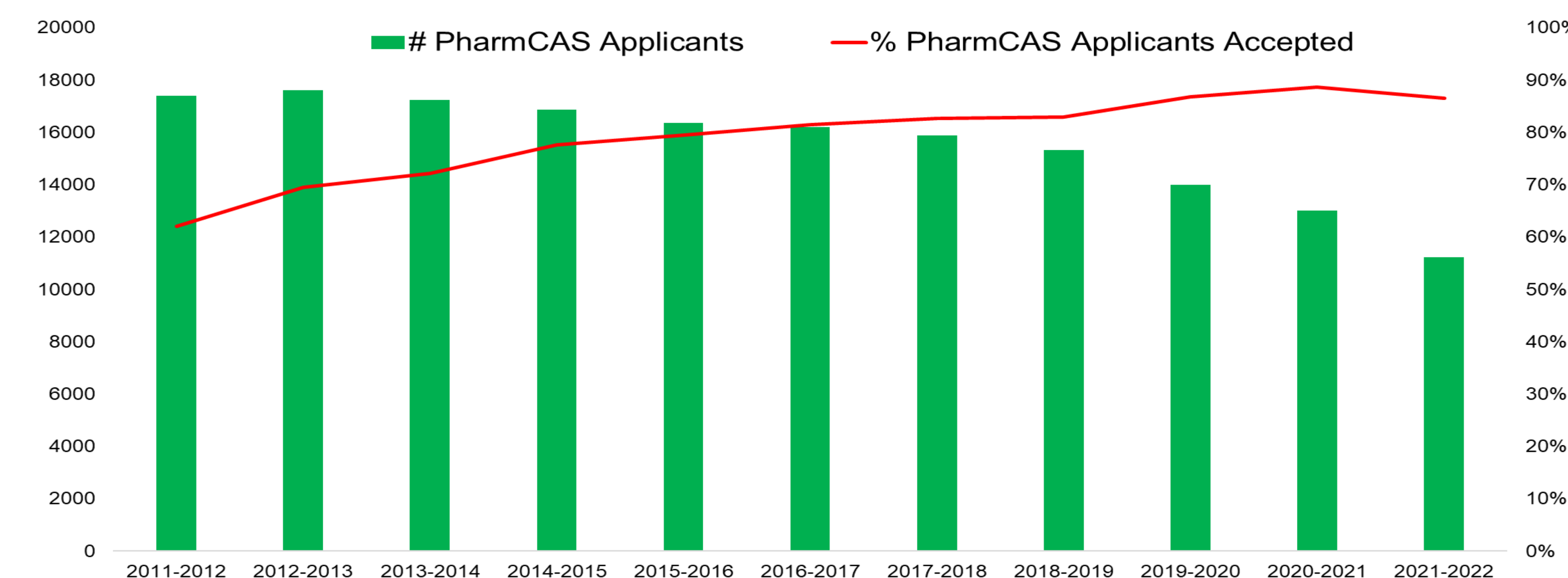


Figure 2: Change in CAS Applicant Volume: 2021-2022.

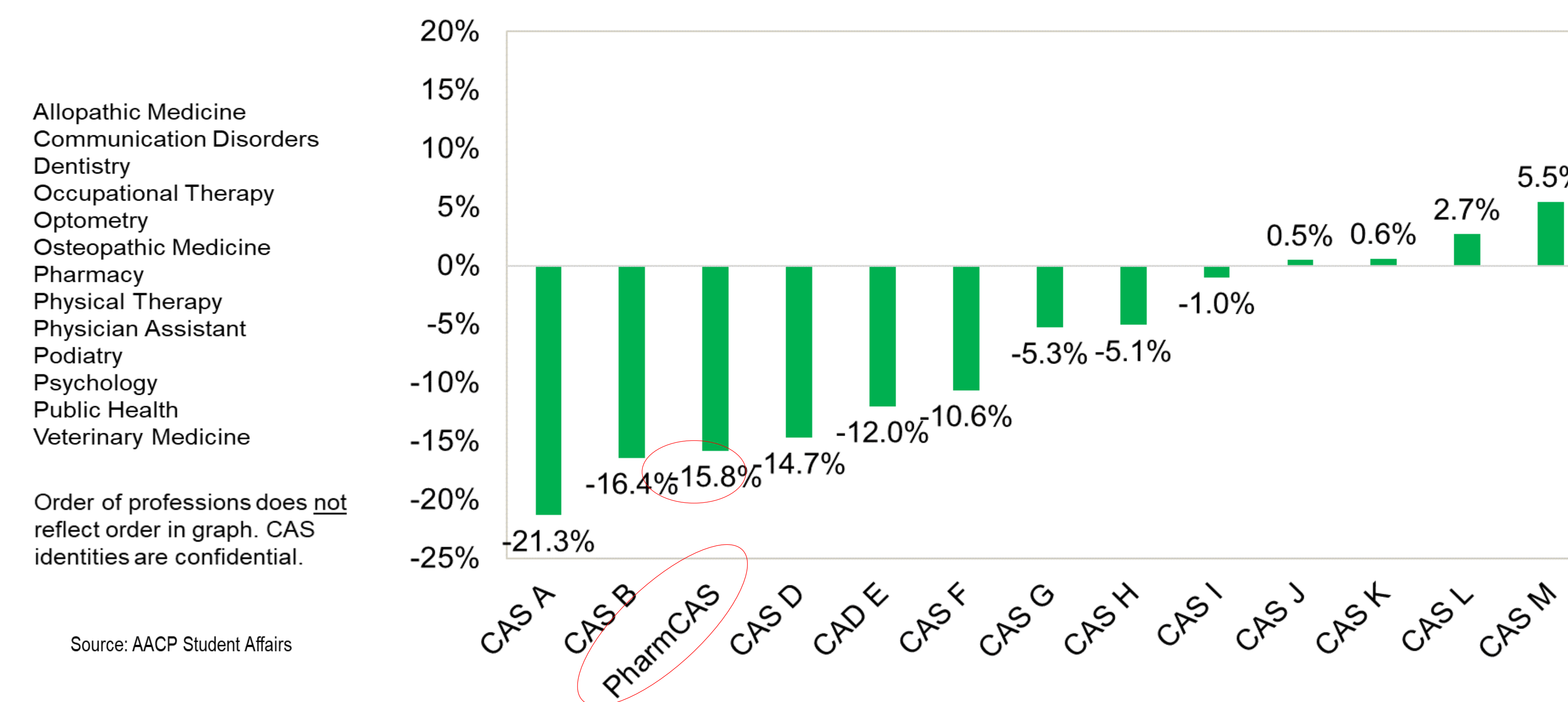


Table 1: Admission Trends in Health Professional Programs for the 2021 Entering Class.

	PharmD	DDM	PA	PT	DO	MD	DVM
# Applicants	13,006	11,759	30,353	17,806	27,277	62,443	10,253
# Matriculants	11,520	6,295	11,235	11,815	8,516	22,666	3,860
Acceptance (PT, PharmD) or Matriculation Rate (other programs)	88.6%	53.5%	37.0%	66.3%	31.2%	36.3%	37.7%
GPA (Matriculants)	3.32	3.59			3.54	3.74	
<b>Nursing</b>							
• Increased Enrollment: Baccalaureate (3.3%), DNP (4%)							
• Decreased Enrollment: Master's (3.8%), RN to BSN (9.6%), PhD (0.7%)							

Table 2: The 2012-2022 NAPLEX Performance, Attrition and Academic Dismissal Rates.

Graduating Class (Year)	PharmCAS SoP/SoP Programs (Number)	Attrition (%)	Academic Dismissals (%)	Admission Cycle (Academic Year)	PharmCAS SoP/CoP Programs (Number)	NAPLEX (Year)	NAPLEX First-Time Pass Rate (%)	NAPLEX First-Time Pass Rate (% YOY)
2022	160	13.3	2.6	2017 - 2018	129	2022	80	-4
2021	134	13.1	3.1	2016 - 2017	126	2021	84	-3
2020	135	12.5	2.9	2015 - 2016	124	2020	87	0
2019	133	12.6	3.1	2014 - 2015	119	2019	87	-2
2018	129	12.1	2.6	2013 - 2014	116	2018	89	1
2017	126	12.1	2.7	2012 - 2013	110	2017	88	2.1
2016	124	12.0	2.7	2011 - 2012	103	2016	85.9	-6.7
2015	119	11.6	2.8	2010 - 2011	96	2015	92.6	-2.2
2014	116	10.3	2.4	2009 - 2010	86	2014	94.8	-0.9
2013	110	11.1	2.6	2008 - 2009	72	2013	95.7	-1.1
2012	103	10.2	2.4	2007 - 2008	59	2012	96.8	1.5

## RESULTS (cont.)

Table 3: Health Professions National Board Exams Average First-Time Pass Rates.

Board Exam Year	Health Profession								
	Pharmacy PharmD NAPLEX	Nursing RN NCLEX	Dentistry DDM INBDE *	Physician Assistant PA PANCE	Physical Therapy PT NPTE ***	Osteopathic Medicine DO COMLEX-3	Allopathic Medicine MD USMLE-3	Osteopathic Medicine DO USMLE-3	Veterinary Medicine DVM NAVLE
2022	80	77.9	97.5	92	82	92.2	91	89	83.9
2021	82	82.5	91.1	93	89	97.1	98	91	87.9
2020	86	86.6	92.6	95	91	97	97	91	87.8
2019	87	88.2	90.3	93	91	97.5	98	100	88.4
2018	89	88.3	92.1	98	91	95.4	97	96	89.1
2017	88	83.3	91.7 **	97	93	96.7	97	100	88.4
2016	85.9	81.4	91.3	96		96.5	96	95	89.8
2015	92.6	84.5	92.5	96		96.4	98	83	90.1
2014	94.8	81.8	92.6	95		96	96	100	90.2
2013	95.7	80.5	93.7	93		95.1	96	92	91.8
2012	96.8	79.5	94.4	91		95	95	100	92.1
10-year average	88.9	83.1	92.7	94.5	89.5	95.9	96.3	94.3	89.0
10-year SD	5.5	3.4	2.0	2.2	3.9	1.5	2.0	5.6	2.2

\* INBDE started in 2022; \*\* Dentistry - new standards in 2017; \*\*\* NPTE - only 5-year records kept  
Source: official reports published by respective licensing boards

## CONCLUSIONS

A distressing decline occurred in pharmacy student admissions, progression, and performance on NAPLEX between 2012 and 2022. During the same period, other health professional programs experienced an increase in admissions and no drastic changes in student performance on licensing exams.

## IMPLICATIONS

Figure 3: The Input-Output/Outcome Framework in Pharmacy Education: Conceptual Model.

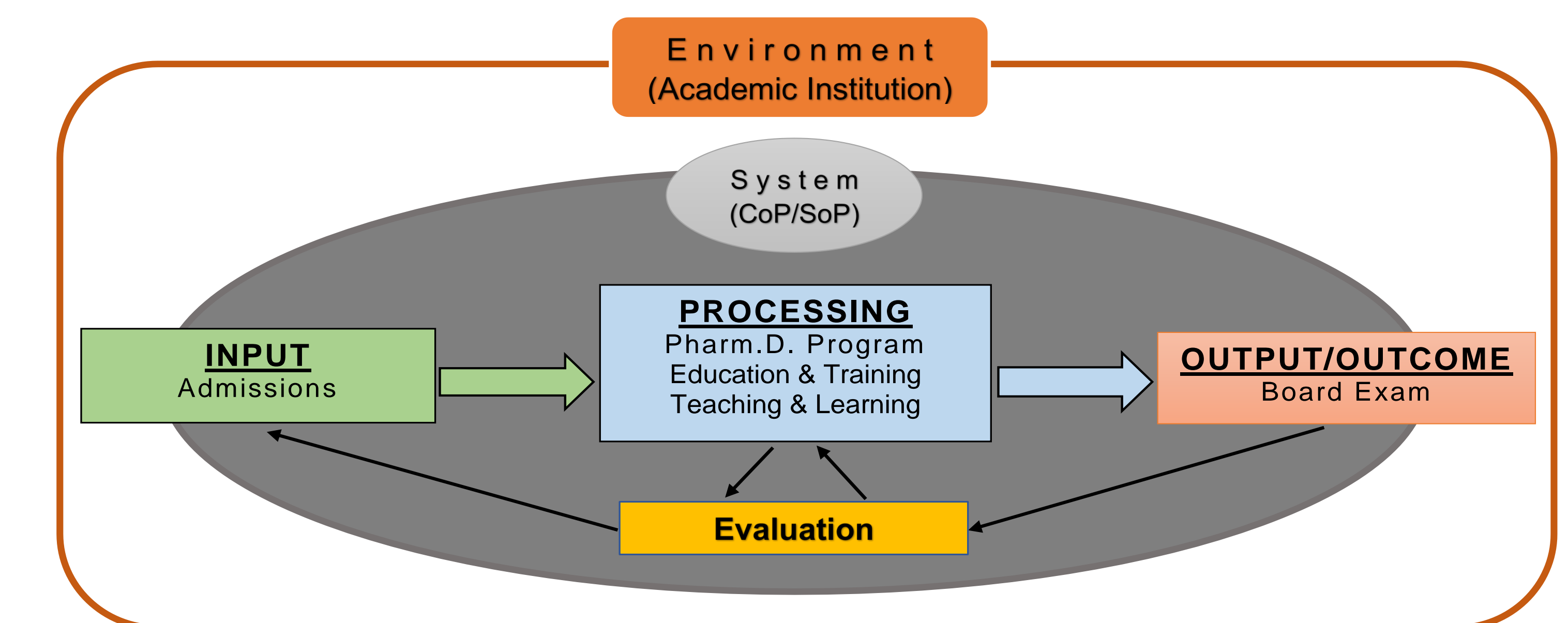


Table 4: Conceptual Distribution of Elements Contributing to the Input-Processing-Output/Outcome Model in Pharmacy Education.

INPUT	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PharmCAS programs (Nr)	59	72	96	96	103	110	116	119	124	126	129
Composite PCAT (accepted)	65.83	56.45	55.25	52.99	52.56	52.56	63.32	62.30	61.80	59.59	59.14
Cumulative GPA (accepted)	3.45	3.42	3.41	3.40	3.40	3.38	3.36	3.34	3.32	3.31	3.30
Accepted (%)	41.4	50.3	54.5	59.8	62.1	69.5	72.2	77.6	79.5	81.4	82.7
Number admitted	6,581	8,168	9,447	10,429	10,804	12,242	12,438	13,086	13,015	13,185	13,139
<b>PROCESSING</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Standards	changed										
Dismissals (%)	2.4	2.6	2.4	2.8	2.7	2.7	2.6	3.1	2.9	3.1	2.6
Attrition (%)	10.2	11.1	10.3	11.6	12.0	12.1	12.1	12.6	12.5	13.1	13.3
<b>OUTPUT/OUTCOME</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
NAPLEX first-time pass rate	96.8	95.7	94.8	92.6	85.9	88	89	87	87	84	80
Satisfaction of Graduates *	81.8	83.9	81.8	81.4	82.1	80.9	77.6	73.5	73.1	72.2	74.4

\* AACP surveys [www.aacp.org/categories/graduating-student](http://www.aacp.org/categories/graduating-student)

## References

Data were obtained from official reports published by respective health professional programs. List of references is available on a separate handout.

## Acknowledgement

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Duc Do and Anna Ratka, Trends in Admissions, Attrition, Dismissals, and Board Performance for Pharmacy Students between 2012 and 2022.

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