



**ANNUAL
MEETING**

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Exploring the relationship between types of certifiers and unsuitable underlying causes of death

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Outlines

- Background
- Objective
- Method
- Results
- Conclusions



Background

Underlying Causes of Death (UCOD)

CAUSE OF DEATH (See instructions and examples)		Approximate interval: Onset to death
32. PART I. Enter the <u>chain of events</u> --diseases, injuries, or complications--that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.		
IMMEDIATE CAUSE (Final disease or condition -----> resulting in death)	a. _____ Due to (or as a consequence of):	_____
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. _____ Due to (or as a consequence of):	_____
	c. _____ Due to (or as a consequence of):	_____
	d. _____	_____
PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I		33. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
		34. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No

Type of Unsuitable UCOD

Unknown and ill-defined

Unknown causes of death

Mechanisms of death

Symptoms, signs and abnormal clinical and laboratory findings

Immediate and intermediate

Immediate (part I.a) and intermediate causes (part I.b, and/or c) are provided

Missing actual underlying causes provided (the lowest line used in Part I)

Nonspecific

Reported and coded UCODs are incomplete

Not sufficiently specific to be useful for public health or research purposes

Items Completed by Certifiers

Items 24-49 To Be Completed By: MEDICAL CERTIFIER	ITEMS 24-28 SHOULD BE COMPLETED BY PERSON WHO PRONOUNCES OR CERTIFIES DEATH, IF APPLICABLE		24. DATE PRONOUNCED DEAD (MM/DD/YYYY)		25. TIME PRONOUNCED DEAD		
	28. SIGNATURE OF PERSON PRONOUNCING DEATH (Only when applicable)		27. LICENSE NUMBER		28. DATE SIGNED (MM/DD/YYYY)		
	29. ACTUAL OR PRESUMED DATE OF DEATH (MM/DD/YYYY)		30. ACTUAL OR PRESUMED TIME OF DEATH		31. WAS CORONER OR MEDICAL EXAMINER CONTACTED? <input type="checkbox"/> Yes <input type="checkbox"/> No		
	<p>CAUSE OF DEATH (See instructions and examples)</p> <p>32. PART I. Enter the <u>chain of events</u>-diseases, injuries, or complications-that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.</p> <p>IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. _____ Due to (or as a consequence of): _____</p> <p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST</p> <p>b. _____ Due to (or as a consequence of): _____</p> <p>c. _____ Due to (or as a consequence of): _____</p> <p>d. _____ Due to (or as a consequence of): _____</p>					<p>Approximate interval: Onset to death</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	
	PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.					33. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
						34. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	35. DID TOBACCO USE CONTRIBUTE TO DEATH?		36. IF FEMALE:		37. MANNER OF DEATH		
	<input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown		<input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to one year before death <input type="checkbox"/> Unknown if pregnant within the past year		<input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		
	38. DATE OF INJURY (MM/DD/YYYY)		39. TIME OF INJURY		40. PLACE OF INJURY (e.g., Decedent's home, construction site, restaurant, wooded area)		
					41. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No		
	42. LOCATION OF INJURY: State: _____ City or Town: _____ County: _____						
	Street & Number: _____ Apartment Number: _____ Zip Code: _____						
	43. DESCRIBE HOW INJURY OCCURRED:				44. IF TRANSPORTATION INJURY, SPECIFY:		
					<input type="checkbox"/> Driver/Operator <input type="checkbox"/> Pedestrian <input type="checkbox"/> Passenger <input type="checkbox"/> Other (Specify) _____		
45. CERTIFIER (Check only one)							
<input type="checkbox"/> Certifying physician-To the best of my knowledge, death occurred due to the cause(s) and manner stated. <input type="checkbox"/> Pronouncing and Certifying physician-To the best of my knowledge, death occurred at the time, date, and place, and due to the cause(s) and manner stated. <input type="checkbox"/> Coroner/Medical Examiner-On the basis of examination and /or investigation, in my opinion, death occurred at the time, date, and place, and due to the cause(s) and manner stated.							
Signature of certifier: _____				46. DATE CERTIFIED (MM/DD/YYYY)			
47. NAME, ADDRESS, AND ZIP CODE OF PERSON COMPLETING CAUSE OF DEATH (Item 32)				47a. NAME OF ATTENDING PHYSICIAN IF OTHER THAN CERTIFIER			
48. TITLE OF CERTIFIER		49. LICENSE NUMBER		50. FOR REGISTRAR ONLY-DATE FILED (MM/DD/YYYY)			

Medical certifiers

Medical certifier	Complete items on a death certificate
Pronouncing physician	24 to 31
<ul style="list-style-type: none">• Confirms the death and determines the time of death, may not be the same person who was the patient's primary care physician.	
Certifying physician	32 to 37, 45 to 49 (sometimes 38 to 44)
<ul style="list-style-type: none">• Completes the medical portion, including the cause and manner of death, based on their medical opinion and available information.	
Pronouncing and certifying physician	24,25,29 to 37,and 45 to 49 (sometimes 38 to 44)
<ul style="list-style-type: none">• Determines and affirms that a person is legally dead, while also completing the cause and manner of death section on the death certificate.	
Medical examiner or coroner	24,25,29,30, and 32 to 49
<ul style="list-style-type: none">• Investigates sudden, violent, or suspicious deaths, determines the cause and manner of death, and coordinates with other agencies, while medical examiners are also skilled physicians or pathologists who perform post-mortem examinations and autopsies as needed.	



Objectives

Study Aims

Primary Aim

- Identify the relationship between unsuitable UCOD for decedents and type of certifier

Secondary Aim

- Explore differences in unsuitable UCOD of specific types of certifier



Methods

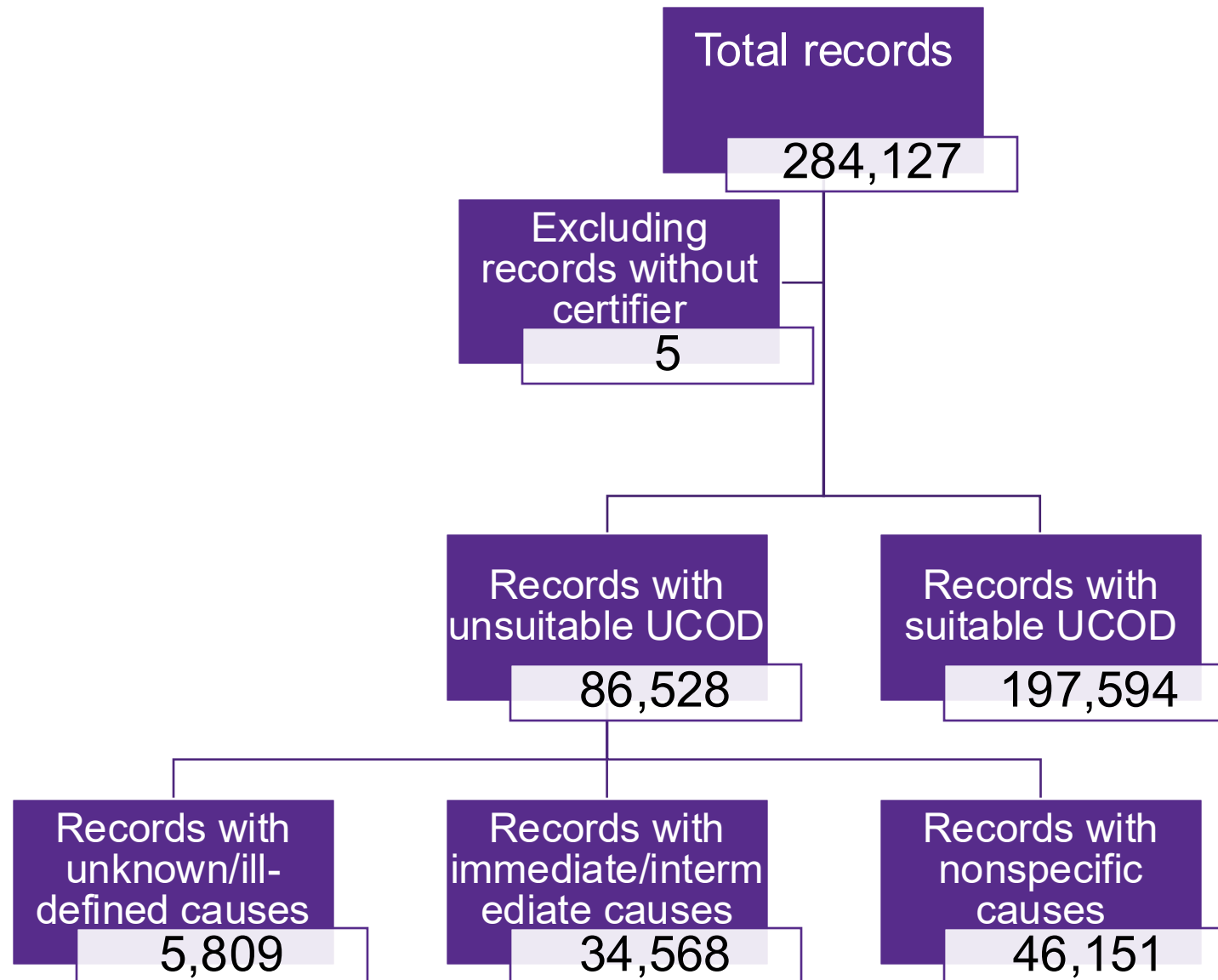
Study methods

- Data Sources: Deaths occurred in SC from 2018 though 2022
- Unsuitable UCOD
 - Unknown/ill-defined causes
 - Immediate/intermediate causes
 - Nonspecific causes
- Medical certifiers
 - Certifying physician
 - Coroner/medical examiner
 - Pronouncing and certifying physician
- Analysis – Descriptive analysis
 - Chi-square tests

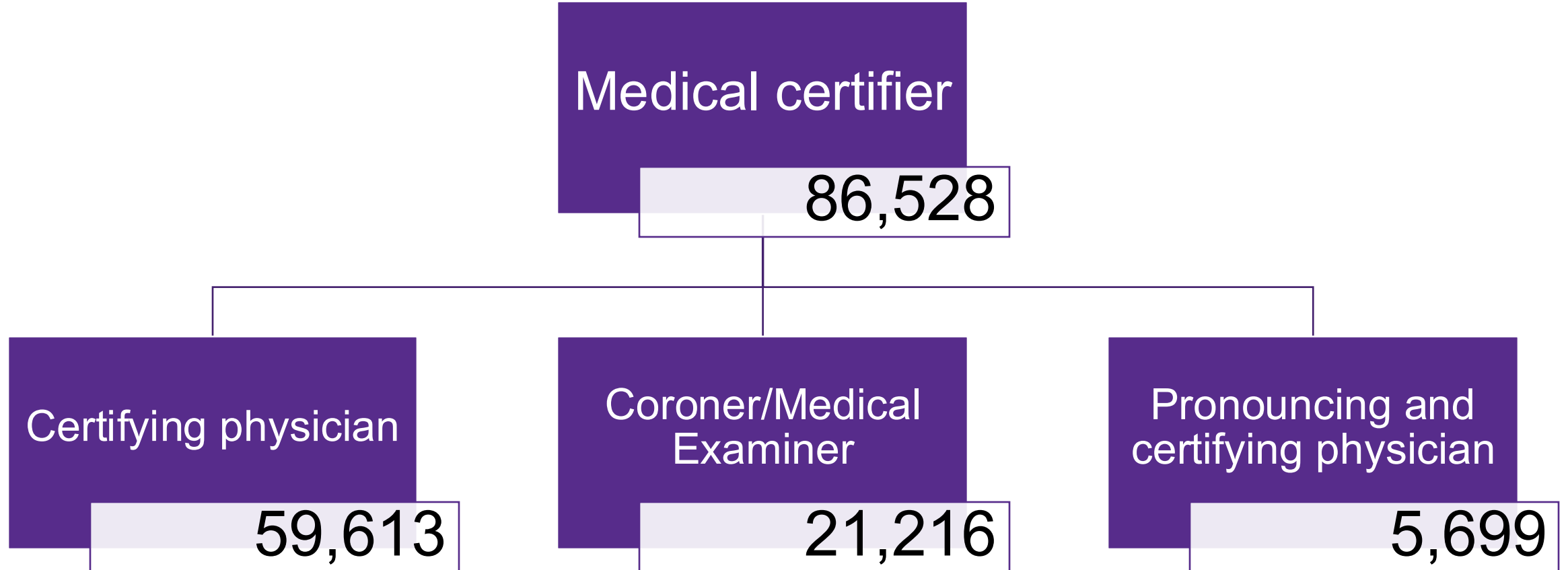


Results

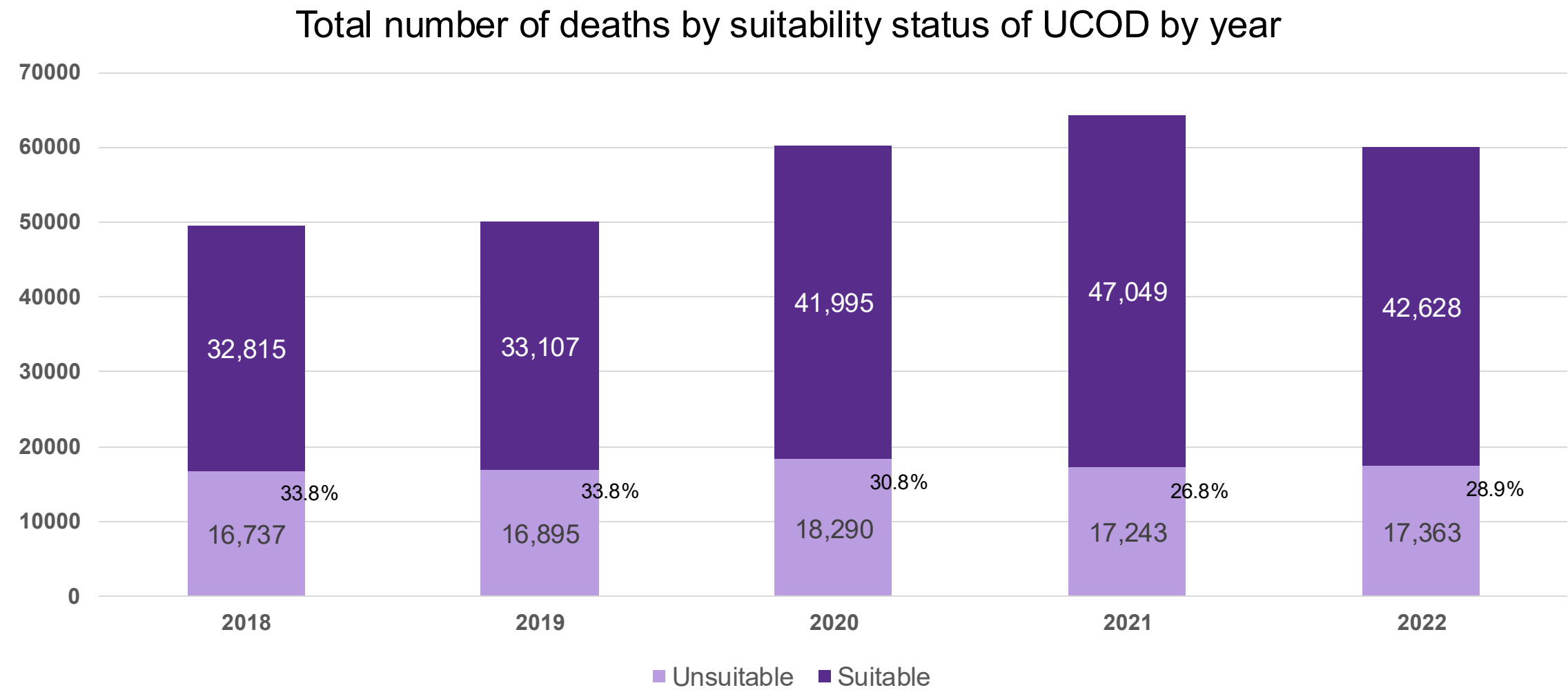
Data source – death certificate records



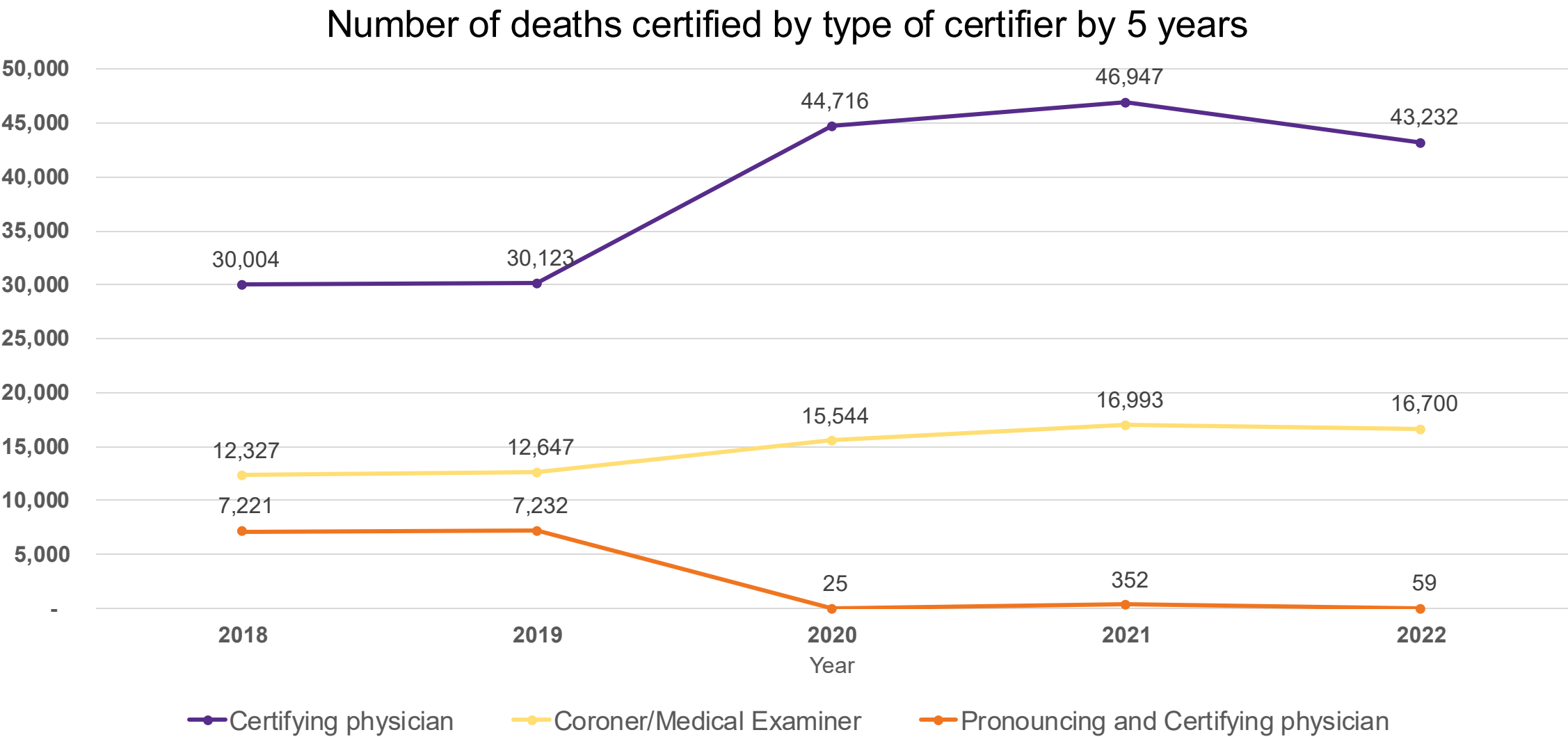
Data source – Medical certifiers



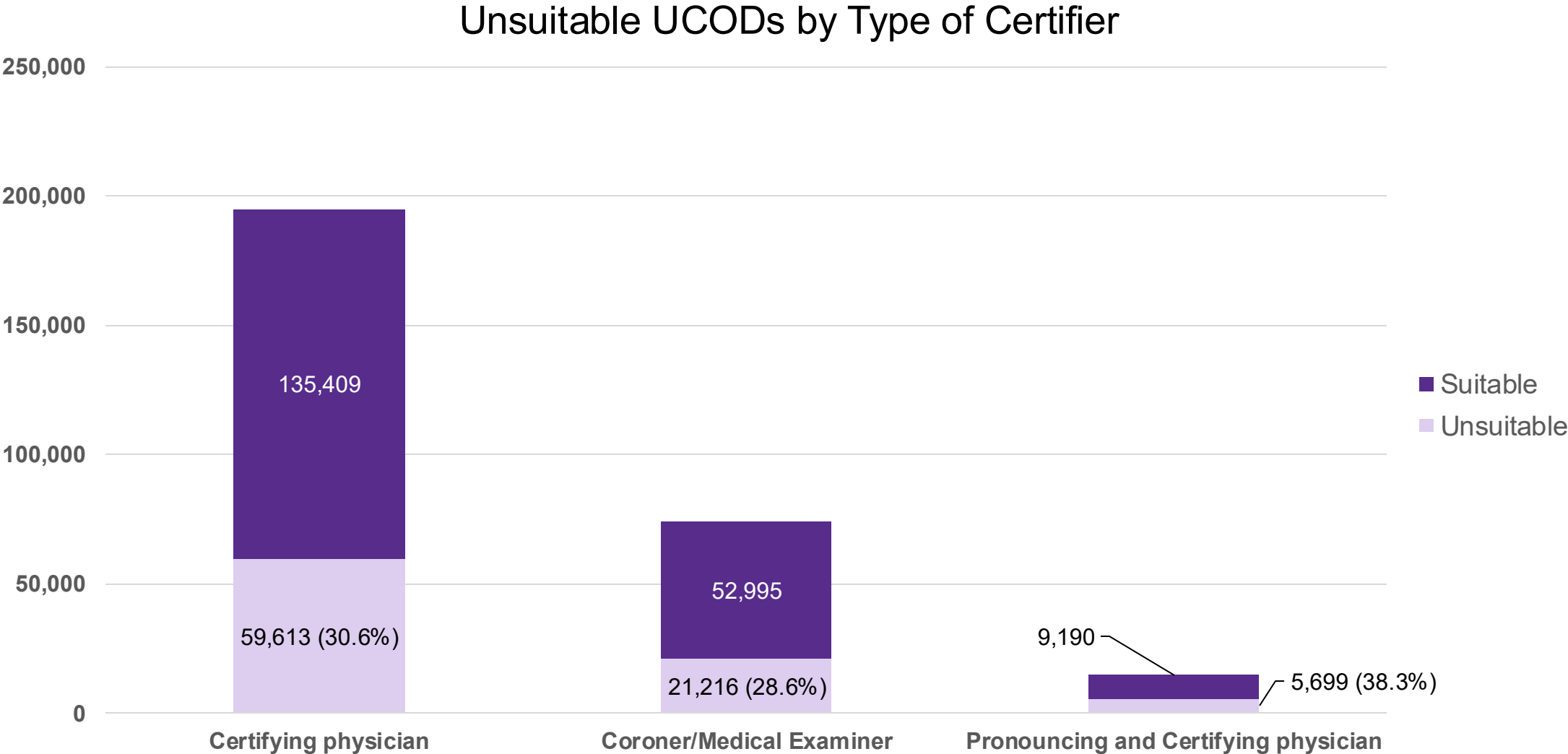
Total number of death records by 5 years



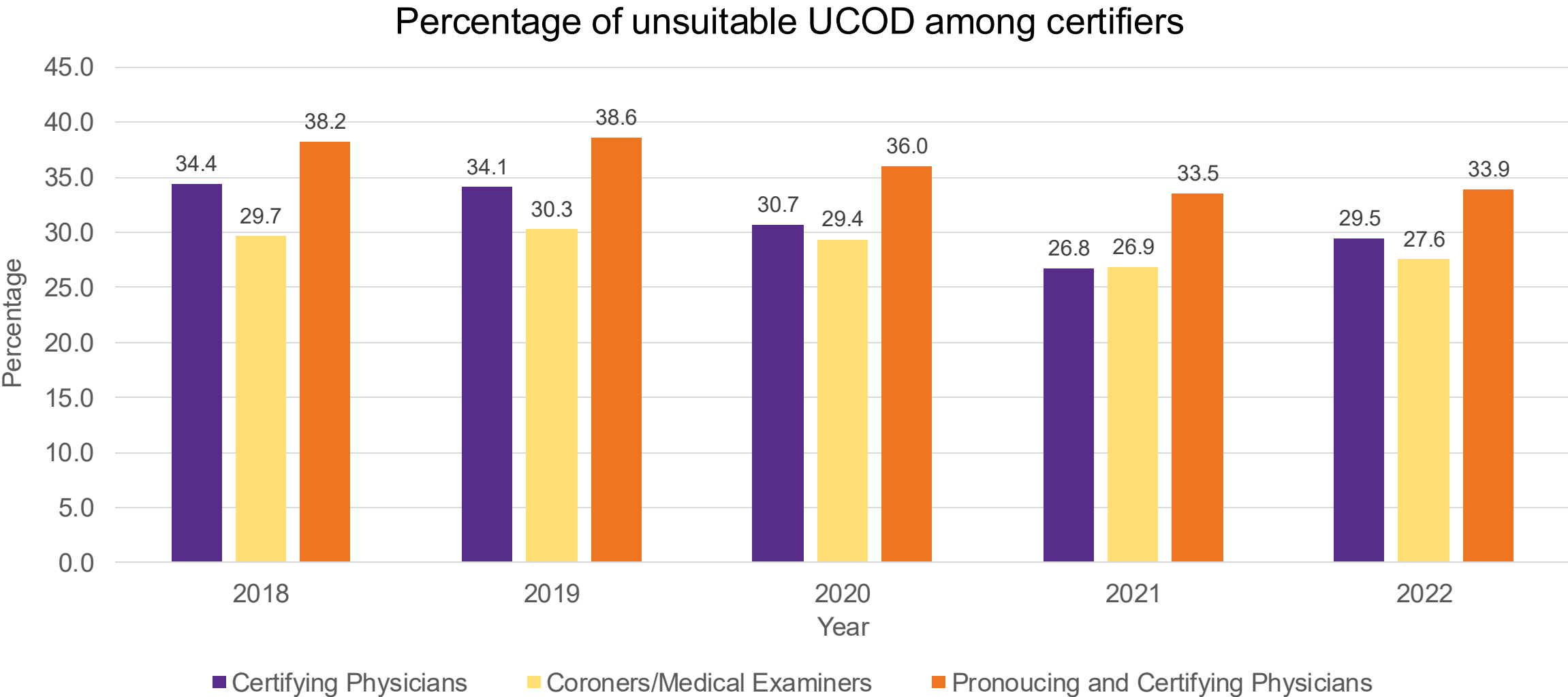
Number of deaths certified by type of certifier



Unsuitable UCODs by type of certifier

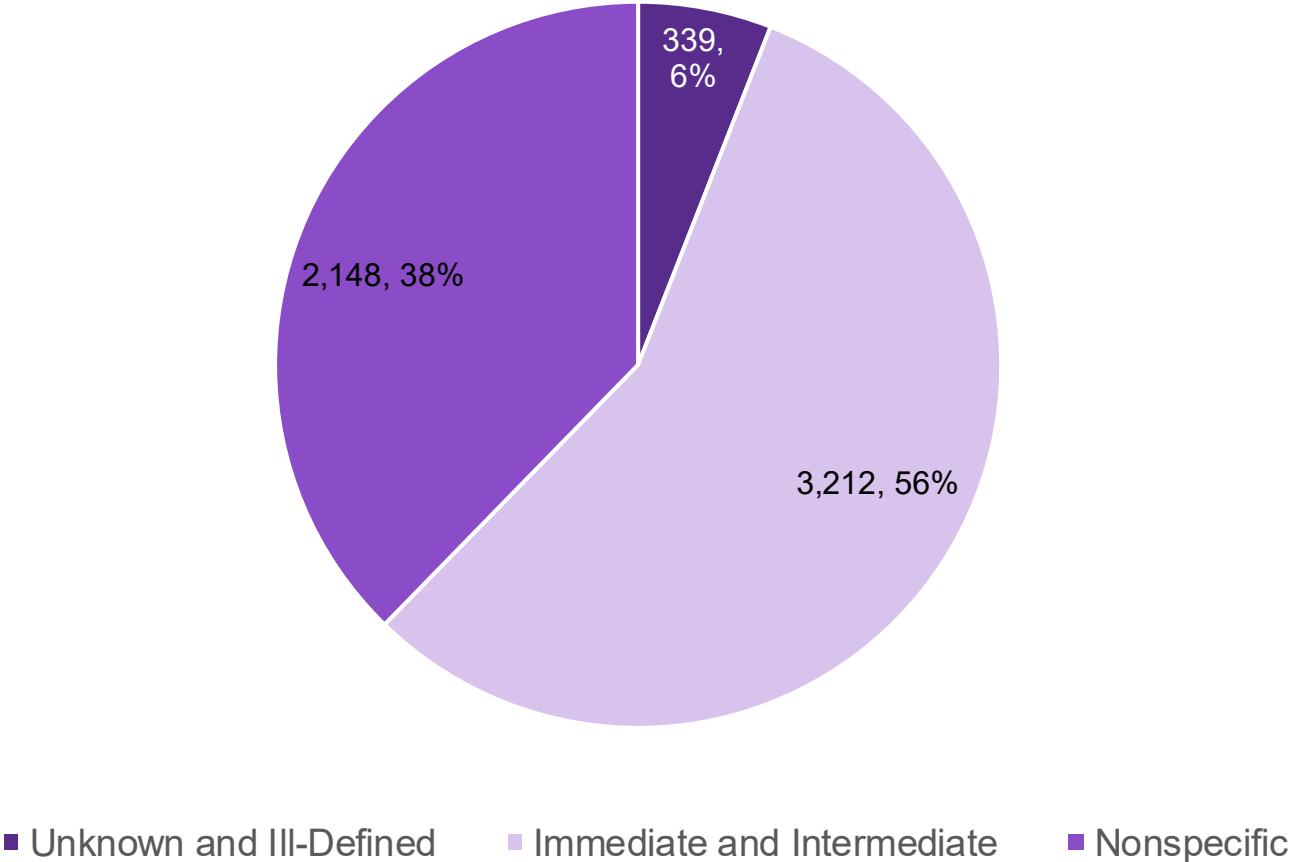


Frequency of unsuitable UCOD by type of certifier for 5 years



Unsuitable causes filed by pronouncing and certifying physician

Unsuitable UCOD filed by pronouncing and certifying physician



Significant test on the type of certifier and unsuitable UCOD

- Test for the relationship between unsuitable UCOD and type of medical certifier.

```
proc freq data=data.final;  
tables unsuitable*cert_statement/chisq;  
run;
```

- The result shows there is a statistically significant relationship between the unsuitable UCOD and the type of certifier with chi-square, two degrees of freedom = 533.2617, $p < .0001$.

Significant test on the subtype of unsuitability and pronouncing and certifying physicians

- Test for difference among subtype of unsuitability for pronouncing and certifying physicians

```
proc freq data=data.final2;  
tables subtype/chisq;  
run;
```

- The result shows there is statistically significant difference between the unsuitable UCOD subtype for pronouncing and certifying physicians with chi-square, two degrees of freedom = 2221.2153, $p < .0001$.



Conclusions

Findings and Limitations

- The unsuitability of UCOD is impacted by the type of certifier
- Pronouncing and certifying physicians were identified as the critical group influencing UCOD quality. High percentages of immediate and intermediate unsuitability may be due to pronouncing and certifying physicians not having full medical history needed to accurately certify cause of death.
- Limitations:
 - The 2020 anomaly (25/60,285 deaths) for pronouncing and certifying physicians may be due to a system upgrade and may not reflect typical trends, reducing broader applicability.
 - Administrative penalties for timeliness introduced in 2022 may have ongoing impacts on decreasing amounts of pronouncing and certifying physicians

Future Studies

- Prioritize developing a training program tailored to specific types of certifier to enhance the quality of UCOD coding
- Based on the variation of unsuitability presented by individual years, additional studies may include analysis of trends over the 5-year range.

References

- Flagg LA, Anderson RN. Unsuitable underlying causes of death for assessing the quality of cause-of-death reporting. National Vital Statistics Reports; vol 69 no 14. Hyattsville, MD: National Center for Health Statistics. 2021.
- National Center for Health Statistics. Physician's handbook on medical certification of death. Hyattsville, MD: National Center for Health Statistics. 2023. DOI: <https://dx.doi.org/10.15620/cdc:131005>.