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Autopsies in Poland 1971–2023

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ABSTRACT: Autopsies, depending on their purpose, can be described as forensic or clinical. Both types are intended to determine the cause of death, but their goal is different. For forensic autopsies, this goal is to provide expertise with evidential value in various legal proceedings. For clinical autopsies, they have historically been seen as a tool in the development and investigation of disease processes. The aim of the study was to determine how the percentage of autopsies changed in Poland in the years 1971–2023. Research material was data obtained from the Polish Central Statistical Office. On the basis of this data, we showed changes in the population number, the number of deaths, and the number of autopsies in the indicated period. It was shown that in Poland, the percentage of autopsies in relation to all deaths in the period from 1971 to 2023 (53 years) fell about 4-fold from the initial level of approximately 16% to only approximately 4% now. This downward trend is consistent with the trends in other EU countries.

Keywords: Clinical autopsy; Forensic autopsy; Cause of death; Percentage of autopsies

1. Introduction

Autopsies, depending on their purpose, can be described as forensic or clinical. Both types are intended to determine the cause of death and may be very similar in principle, but their goal is different. For forensic autopsies, this goal is to provide expertise with evidential value in various legal (mainly criminal, but sometimes civil or insurance) proceedings. Sometimes it is only about official confirmation of an obviousness. Clinical autopsies were historically seen as a tool in the development and investigation of disease processes, because diagnostic possibilities at that time were limited and the cause of death often remained unknown. Still, this function seems to disappear in the face of the enormous progress of various diagnostic methods. Therefore, cases where the nontraumatic death of a patient is a surprise are rare, and more often an autopsy is only about confirming and detailing clinical suspicions. The number of clinical autopsies around the world is decreasing, especially if relatives are asked permission. In such cases, relatives will often fail to see the importance for society and will feel a need to protect the deceased. But also clinicians are responsible for this trend. They are often not interested because of a mistaken trust in recent advances in diagnostic methods, financial restraints, and a negative attitude in the lay public. In case of forensic autopsy, where a crime is suspected, neither relatives, nor others usually do not have much possibility of hindering an autopsy, so their number is more stable [1].

The medicolegal death investigation system in Poland was described in detail in a previous publication [2]. Under the article 209 of the Polish Code of Criminal Procedures [3], if suspicious of criminal activity, an external examination of the body at the scene of the crime and later a forensic autopsy shall be performed. This suspicion is the only statutory prerequisite for a forensic autopsy. According to the Code, these procedures are mandatory. These investigations are aimed at identifying the cause of death and details relevant to the circumstance of death. The decision on whether to deploy them is taken solely by the state prosecutor conducting the investigation. A mere suspicion that death has been caused by criminal means obliges the state prosecutor to order an external examination of the body at the place of its discovery and a forensic autopsy [4].

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Unlike forensic autopsies, clinical autopsies are not obligatory in Poland. The relevant act states that the body of a patient who died in a hospital may, but does not have to, undergo an autopsy [5]. These regulations only apply to hospital deaths, and as for deaths in other places, e.g., in other units of the health care system or at home, there are no regulations at all. However, even in the case of hospital deaths, the issue of an autopsy is usually consulted with the families of the deceased.

In addition to the forensic and clinical autopsies, in Poland the regulations theoretically allow the ordering of an autopsy of a deceased person in whom an infection (defined as the entry into the body and development of a biological pathogen in it) or an infectious disease (defined as a disease caused by a biological pathogen) has been diagnosed or suspected, however, in practice this regulation is not applied [6].

Furthermore, there are autopsies on private orders, requested for various reasons by relatives of the deceased. However, this is a marginal phenomenon.

Certification of death in Poland involves filling out a death certificate, which is used for official registration of the death, arranging the burial, and for statistical purposes. In Poland, certification of death is generally the task of a doctor, usually a family doctor or, in the case of a hospitalized patient, a hospital doctor. Recently (since 22 June 2023), regulations have also allowed paramedics to do this, but only if death occurs during an ambulance intervention. Death certificate forms in force since 1 February 1971 contain information on whether an autopsy was performed (without indicating whether it was forensic or clinical), whereas previously applicable forms did not contain such information.

The percentage of autopsies in different countries in the world is shown in the World Health Organization (WHO) study [7]. This study covers the years 1970–2023, although data for individual countries often do not cover the entire period. The percentage of autopsies varies dramatically in different countries and the lowest current value given in the WHO report is 1.1% for Georgia, while the highest is 83.7% for Armenia. The current average for EU countries (of course, those that provided data) is 8.6% (2022), while previously it was 13.3% (2010), 15.4% (2000), and 21.8% (1990). In general, the percentage of autopsies worldwide, except for a few exceptions, has a downward trend.

Since WHO study does not include data for Poland the aim of the study was to determine how the percentage of autopsies changed in Poland in the years 1971–2023 and to compare the trend with other EU countries.

2. Materials and Methods

The research material was data obtained from the Polish Central Statistical Office [8], to which we asked for the population number as of December 31, the number of deaths, and the number of autopsies performed in subsequent years in the period 1971–2023. Since data on the number of autopsies for 1971 were available only for 11 months (February–December), we extrapolated them to the whole of 1971 (by multiplying by 12/11). We presented the data obtained in this way in a table and on figures showing the population number, the number of deaths in absolute values and as a percentage of the total population, and the number of autopsies in absolute values and as a percentage of all deaths.

3. Results

Table 1 presents data on the population number, the number of deaths, and the number of autopsies performed in subsequent years in the period 1971–2023 in Poland. Based on this data, figures were created showing: the population number in millions (Figure 1), the number of deaths in hundreds of thousands (Figure 2), the percentage of deaths in relation to the total population (Figure 3), the number of autopsies and its trend (Figure 4), and the percentage of autopsies in relation to all deaths and its trend (Figure 5).

Table 1. The population number, the number of deaths, and the number of autopsies performed in subsequent years in the period 1971–2023 in Poland.

Year	Population	Deaths	Autopsies
1971	32,909,093	285,742	46,089 *
1972	33,202,290	267,418	40,248
1973	33,512,156	279,491	40,523
1974	33,845,698	279,655	38,546
1975	34,184,738	299,505	40,924
1976	34,527,892	306,781	40,275
1977	34,850,228	315,595	42,196
1978	35,080,682	328,080	41,538
1979	35,413,434	325,984	38,825
1980	35,734,865	353,164	39,641
1981	36,062,309	331,884	34,255
1982	36,398,652	337,874	33,839
1983	36,744,964	352,237	34,854
1984	37,063,303	367,562	34,086
1985	37,340,467	383,973	34,166
1986	37,571,771	378,781	34,253
1987	37,764,318	380,663	32,278
1988	37,884,655	373,018	31,043
1989	37,988,403	383,074	30,660
1990	38,073,160	390,343	34,856
1991	38,143,970	405,716	32,809
1992	38,202,852	394,729	29,344
1993	38,239,451	392,259	28,481
1994	38,265,341	386,398	29,450
1995	38,284,143	386,084	30,017
1996	38,294,085	385,496	28,945
1997	38,289,723	380,201	28,108
1998	38,276,727	375,354	27,031
1999	38,263,303	381,415	26,930
2000	38,253,955	368,028	26,013
2001	38,242,197	363,220	25,892
2002	38,218,531	359,486	26,525
2003	38,190,608	365,230	26,320
2004	38,173,835	363,522	27,238
2005	38,157,055	368,285	28,336
2006	38,125,479	369,686	29,647
2007	38,115,641	377,226	30,420
2008	38,135,876	379,399	29,693
2009	38,167,329	384,940	28,067
2010	38,529,866	378,478	26,831
2011	38,538,447	375,501	26,098
2012	38,533,299	384,788	25,835
2013	38,495,659	387,312	25,495
2014	38,478,602	376,467	23,946
2015	38,437,239	394,921	22,693
2016	38,432,992	388,009	21,791
2017	38,433,558	402,852	22,187
2018	38,411,148	414,200	22,091
2019	38,382,576	409,709	21,385
2020	38,088,564	477,355	19,028
2021	37,907,704	519,517	19,032
2022	37,766,327	448,448	17,674
2023	37,636,508	409,036	16,796

* This is an extrapolated value for the whole of 1971. In fact, persons who died during the 11-month period of 1971 (February–December) had 42,248 autopsies, and the value of 46,089 was obtained by multiplying this value by 12/11.

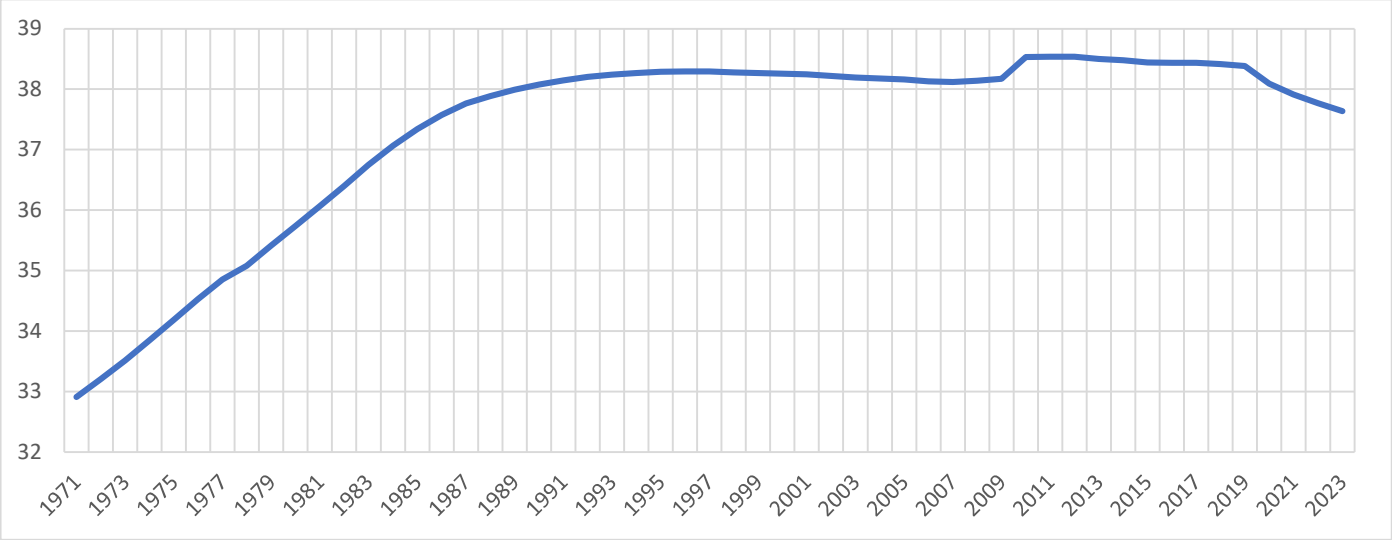

Figure 1. The population number in Poland (in millions) in subsequent years in the period 1971–2023.

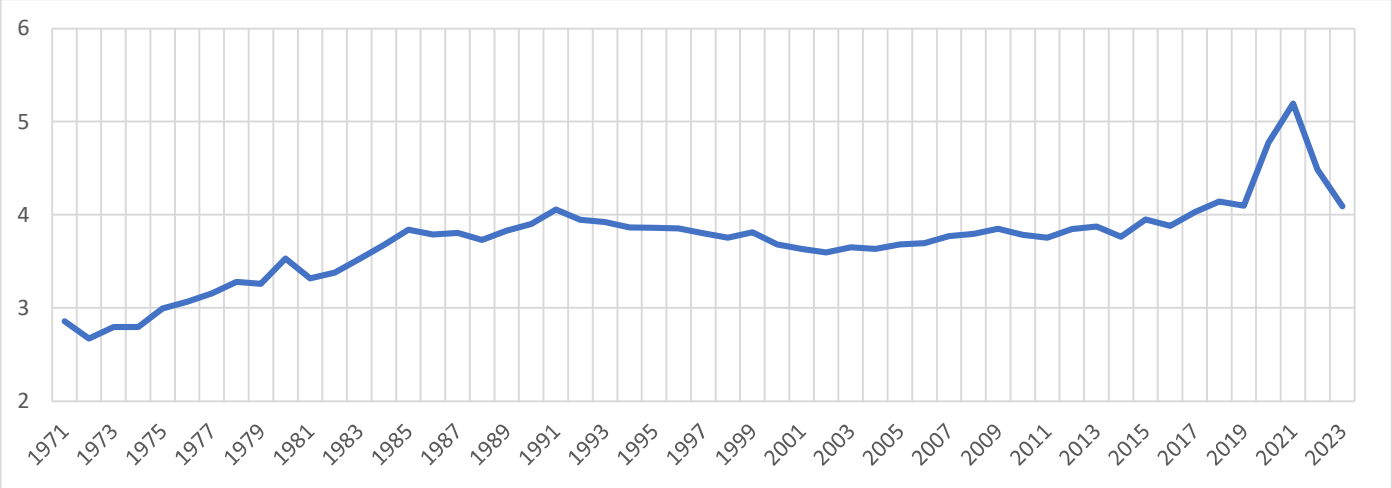

Figure 2. The number of deaths in Poland (in hundreds of thousands) in subsequent years in the period 1971–2023.

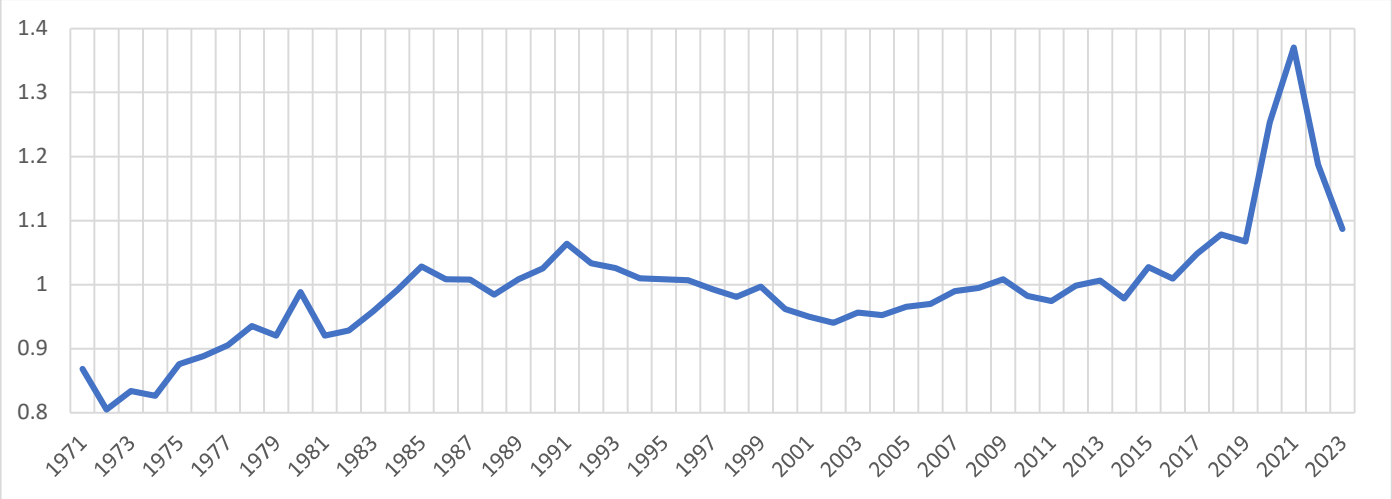

Figure 3. Percentage of deaths in relation to the total population in Poland in subsequent years in the period 1971–2023.

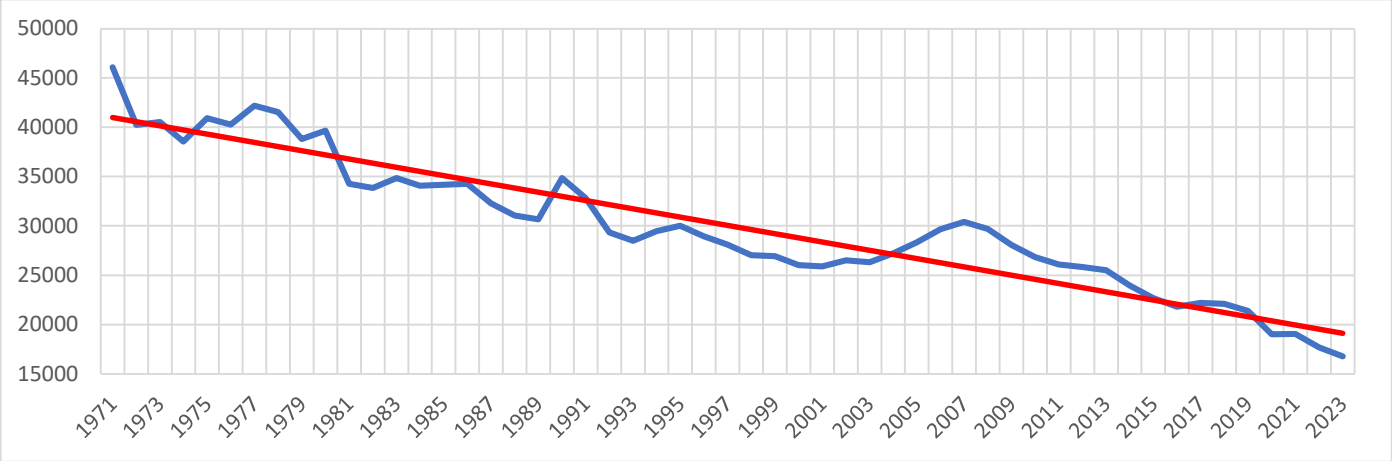

Figure 4. The number of autopsies (blue) in Poland in subsequent years in the period 1971–2023 and trend line (red).

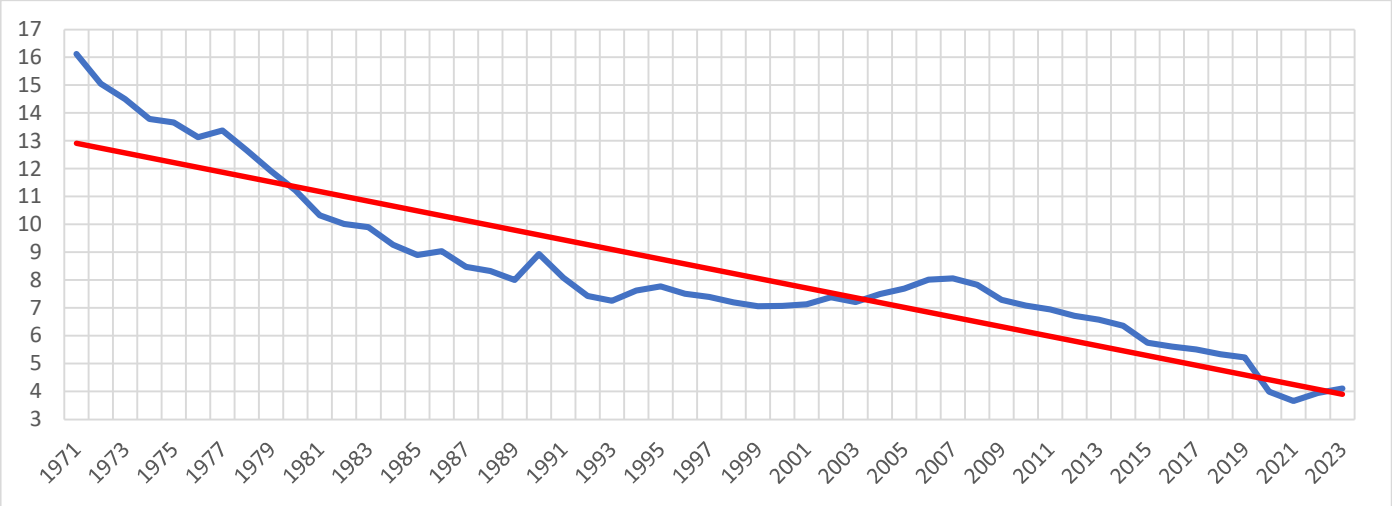

Figure 5. Percentage of autopsies (blue) in relation to all deaths in Poland in subsequent years in the period 1971–2023 and trend line (red).

4. Discussion

Since WHO study [7] does not include data from Poland, our research on Polish data covering the years 1971–2023 allows us to fill this gap and draw conclusions regarding long-term trends in the percentage of autopsies in our country.

The first three figures show the size of the entire population of Poland in the studied time period (Figure 1), the number of deaths (Figure 2) and the percentage of deaths in relation to the total population (Figure 3). Figure 1 shows a nearly linear increase in population from the initial level of about 33 million to about 38 million, lasting until about 1990. This increase is the result of the so-called mid-20th-century baby boom, *i.e.*, a significant and persistent increase in fertility rates in many countries, especially in the western world, generally considered to have started immediately after World War II [9]. After this period, there was a multiyear stabilization, followed by a slight decrease in the years 2020–2022 caused by the COVID-19 pandemic. An almost mirror image of these phenomena is also visible in Figure 2, where after an initial increase in mortality correlated with the increase in population size, we see further multiyear stabilization, disrupted only in 2020–2022 by the COVID-19 pandemic. The increased number of deaths was, on the one hand, caused directly by the pandemic in connection with SARS-CoV-2 infections, but also indirectly due to difficulties in access to health care, restrictions introduced (not always rational), fatigue and overwork of health care workers, which facilitated medical errors, or deterioration of health resulting from the stress and anxiety that accompanied everything at that time. In the last year under review (2023), mortality returned to the prepandemic level. A similar almost mirror image is also visible in Figure 3, where mortality expressed as a percentage of the entire population fluctuated around 1% for many years of stabilisation, and larger deviations from this value occurred only in the baby boom period (less value) and during the pandemic period (greater value). These three figures were needed to proceed to the analysis of the percentage of autopsies because it must be embedded in the realities of the population.

The next two figures show the number of autopsies and its trend in absolute values (Figure 4) and the percentage of autopsies in relation to all deaths and its trend (Figure 5). These graphs have a completely different course than the previous ones. Both the number of autopsies in absolute values and the percentage of autopsies in relation to all deaths show a nearly linear decline throughout the study period. Figure 4 shows that from the initial level of about 46 thousand autopsies per year there was an almost 3-fold decline to a level of only about 17 thousand per year, despite the fact that the population increased from about 33 to about 38 million, *i.e.*, by about 15%. This trend is even more clearly visible in Figure 5, where the percentage of autopsies in relation to all deaths fell about 4-fold from the initial level of approximately 16% to only approximately 4%.

An inconvenience of this study is the lack of possibility of dividing the number of autopsies we received for analysis into forensic and clinical. However, this results from the way statistical data is collected in Poland. Despite this inconvenience, we believe that the presented analysis is of great practical importance, as it shows how much the number and percentage of autopsies have decreased over the course of more than half a century. This decreasing trend is consistent with trends in other countries. For example, WHO data indicate that the number of autopsies is decreasing in the Baltic and Scandinavian countries, the Czech Republic and Slovakia, while the number of autopsies has increased in Russia (in 2020, 70% of the deceased were autopsied). Unfortunately, many large countries in Europe do not provide such data, including Germany, France, Spain and Italy [7]. It can be assumed to be mainly due to the decrease in the number of clinical autopsies and, to a lesser extent forensic autopsies [1,10,11].

The reasons for this phenomenon are probably different, but it seems that the most important is the emergence of new diagnostic methods that allow a departure from the very invasive procedures necessary in classical autopsy, produced and developed in many respects in 19th-century Germany [1]. Herat et al. summed it up: "In the 21st century, most questions raised by the family, clinicians, the coroner (medical examiner), courts, and law enforcement agencies can be answered with a complete external examination of the body, a total body CT scan +/− magnetic resonance imaging, and a targeted dissection or minimally invasive approach incorporated with sample collection for further testing. This is cost-effective and can produce reviewable data" [12]. This is true, and the world will probably go in this direction.

In Poland, current regulations do not require clinical autopsy (which can, but does not have to, be performed in certain cases), while forensic autopsy is still obligatory and must consist of external examination, as well as of 'opening the body'. However, it is enough that the relevant article of the Polish Code of Criminal Procedures instead of 'opening the body' receive the more general wording of 'examination of the body' and the way to abandon 19th-century procedures will be wide open.

5. Conclusions

In Poland, the percentage of autopsies in relation to all deaths in the period from 1971 to 2023 (53 years) fell about 4-fold from the initial level of approximately 16% to only approximately 4% now. This downward trend is consistent with the trends in other EU countries. The most important reason for this phenomenon is the possibility of replacing the very invasive procedures necessary in classical autopsy, produced and developed in many respects in 19th-century Germany, with new diagnostic methods.

Author Contributions

Conceptualization, A.S. and J.B.; Methodology, A.S. and J.B.; Investigation, A.S. and J.B.; Writing—Original Draft Preparation, A.S. and J.B.; Writing—Review & Editing, A.S. and J.B.

Ethics Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

All data can be freely available upon request to the corresponding author.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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