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WOMEN'S EXPERIENCES OF MATERNITY CARE IN THE FIRST WAVE OF THE COVID-19 PANDEMIC IN POLAND: A CROSS-SECTIONAL STUDY

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: The coronavirus disease-19 (COVID-19) pandemic significantly affected maternal care services.

Aim of the study: This study aimed to identify the level of changes in care experienced by pregnant women during the first wave of the COVID-19 pandemic and to compare responses between three major modes of maternity care financing (public, fee-for-service, and private healthcare insurance).

Material and methods: This cross-sectional study of 685 pregnant women in Poland used the author's questionnaire, which included questions regarding demographic data, maternity care mode of financing, and different aspects of care.

Results: The vast majority (n=608, 95.6%) of respondents experienced changes in care during the COVID-19 pandemic. The most frequently reported modification was no possibility of a partner being present during prenatal consultations and medical examinations (n=558, 87.7%). Those who used private healthcare insurance experienced more frequent medical appointment cancellations (p=0.000), a decrease in the number of consultations (p=0.000), and reduced healthcare service durations (p=0.019). Over half of respondents used teleconsultations or e-consultations. The respondents who used healthcare insurance had lower satisfaction with maternity care across all issues than women who used public and fee-for-service care.

Conclusions: The COVID-19 pandemic affected women's maternity care experiences, with the financing mode differentiating their experiences. An increase in the use of telemedicine for maternity care during the SARS-CoV-2 pandemic may provide a beneficial solution for future crises.

KEYWORDS: maternity care, maternal care services, COVID-19, SARS-CoV-2

Background

The coronavirus disease 19 (COVID-19) outbreak and subsequent pandemic caused changes in all areas of human life and necessitated adaptations in healthcare services. In many healthcare facilities, measures were put in place to minimize the potential exposure of patients and healthcare workers to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The organizational changes associated with maternity care had to include meeting the needs of women throughout pregnancy. The sudden implementation

of new solutions in maternity care models impacted those receiving maternity care (pregnant women and their partners) and those providing care [1–5].

One of the major changes in many inpatient and outpatient maternity care units was restrictions put on birth partners and visitors, who were often excluded from accompanying women to outpatient appointments and pregnancy-related hospitalizations [1,3,6]. Many facilities also reduced the number of perinatal consultations to minimize infection risk, especially for women with a low-risk pregnancy [1]. In addition, pregnant women sometimes canceled consultations [7] and decided not to have some of the recommended prenatal diagnostic procedures, which may have been a result of their concerns associated with SARS-CoV-2 infections [8].

During the COVID-19 pandemic, many countries established guidelines for healthcare workers to keep their communities infection-free [1,9,10]. The recommendations addressed issues such as the use of personal protective equipment (PPE), physician staffing allocation, rapid redeployment to address changing needs [9], and the separation of medical staff working in the community from those working in hospitals [11]. Also, in Poland, when the COVID-19 pandemic started, the Ministry of Health recommended a limitation of workplaces by healthcare professionals [10]. The solutions may have prevented the "circulation" of the virus between two or more places and helped decrease the risk of transmission from one setting to another. Gynecologists and obstetricians, who mainly provide pregnancy care in Poland, are often employed in wards and facilities [3], and their limited numbers in workplaces during the COVID-19 pandemic [12] may have forced changes to the provisions of pregnancy care for Polish women.

The new guidelines introduced during the COVID-19 pandemic also recommended using telemedicine. In-person visits were often replaced by or supplemented with teleconsultations or e-consultations, and patients were also encouraged to engage in self-care, such as home blood pressure monitoring [1,2,13].

Aim of the study

This study aimed to identify changes in maternity care experienced by women during the first wave of the COVID-19 pandemic using women's self-assessment of the quality of healthcare services, including teleconsultations and compared these experiences across three major modes of maternity care financing in Poland, namely publicly-funded care, private healthcare insurance, and fee-for-service care. By doing so, we aimed to add to the discussion on how the COVID-19 pandemic affected different groups of people in the area of maternity care.

Material and methods

Study desing and setting

This cross-sectional study was conducted between May and July 2020 among pregnant women in Poland. The first wave of the COVID-19 pandemic started in Poland on March 4th, 2020 (the first confirmed Polish case of SARS-CoV-2 infection) and continued until June 2020. From mid-May 2020, many restrictions were routinely abolished, indicating that the first wave of the pandemic was dying out [14].

Maternity care in Poland

Maternity care in Poland is overwhelmingly doctor-led, with midwives almost completely excluded from the provision of maternity care [15]. The Polish standards for healthcare during pregnancy recommend that appointments with maternity care providers, including laboratory tests, should occur at least every three to four weeks. Moreover, at least one ultrasound should be undertaken at each stage of the pregnancy [16].

In Poland, women are entitled to free publicly-funded maternity care [17], with the costs of consultations and examinations covered by public funds under the National Health Fund (NHF, in Polish: Narodowy Fundusz Zdrowia) [18]. However, there is a widely developed network of private medical services that pregnant women can use either on a fee-for-service basis or as part of private healthcare insurance paid for by the patient or those offered by employers as part of their health benefit plans [19].

Table 1 shows the three major types of maternity care financing in Poland, though some women may use multiple types of financing simultaneously. For example, pregnant women often use obstetrician consultations under NHF but decide on paid laboratory tests and ultrasound examinations [19]. Other women use publicly funded care or private healthcare insurance for most of their visits while undergoing some consultations with private obstetricians on a fee-for-service basis.

In our study, we focus on differences in care between three major funding sources, excluding questionnaires in which respondents declared using care financed from more than one source.

Impact of the COVID-19 pandemic on maternity care

In March 2020, Polish consultants in gynecology, obstetrics, and perinatology published the first guidelines regarding maternity care during the COVID-19 pandemic in Poland. These recommended that healthcare facilities ban birth partners and visi-

Table 1. Characteristics of Funding Sources for Maternity Care in Poland

Characteristics' category / Funding source	Healthcare under National Health Fund	Private healthcare insurance	Fee-for-service healthcare
Funding	publicly funded and available to any pregnant woman	covered by an employer and/or the patient	patient contribution
Range of maternity care services	specified basket of guaranteed services	available services depend on the package chosen (from minimum a package including basic services to a very important person [VIP] package with the widest range of services)	the range of available services the patient can choose from depends on the provider in each case
Places of provision	healthcare centers with a National Health Fund contract	network healthcare centers	private healthcare centers

tors and suggested changes to the implementation of perinatal consultations [13,20].

Many healthcare facilities adopted preventive measures during the first wave of the pandemic in Poland, such as switching in-person medical appointments to teleconsultations or e-consultations [21].

Data collection

We used a questionnaire designed for this study, which included questions on the respondents' sociodemographic status, mode of perinatal care financing used, and changes in maternity care provisions experienced during the COVID-19 pandemic, such as access to teleconsultations. It also included questions to evaluate the care each woman received, with respondents asked to evaluate the maternity care on a scale of 0 to 10, where 0 meant they were very dissatisfied with the care and 10 indicated they were very satisfied with the care.

Sample size

The study population was calculated based on 2019 births occurring after 28 weeks of pregnancy in Poland. According to Statistics Poland (in Polish: Główny Urząd Statystyczny), the total study population was approximately 374,535 [22]. A margin of error of ±5%, a confidence error of 95%, and a 50% response distribution were used to calculate the sample size, indicating a minimum required sample size of 384 participants.

Participants and recruitment

The study group was selected based on the following criteria:

Inclusion criteria:

- Women over 18 years of age who agreed to participate in the study, sought maternity services in Poland and were in the third trimester when filling in the questionnaire.

Exclusion criteria:

- Women who used multiple simultaneous sources of care funding.

We chose women in their third trimester of pregnancy to assess the changes related to maternity care during the COVID-19 pandemic. The first and second trimesters of pregnancy for these women occurred before the first wave of the pandemic in Poland, so their opinions on changes in maternity care are the most reliable.

Participant recruitment used a computer-assisted web interview (CAWI) prepared in the profitest.pl platform (available in Poland) and distributed in social media groups for pregnant women.

We collected 685 completed questionnaires. Due to the refusal to participate in the study or the absence of meeting the inclusion criteria, 49 questionnaires were excluded from the statistical analysis, leaving 636 participants in total (Figure 1).

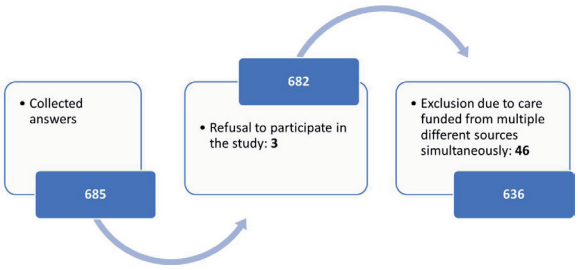

Figure 1. Flowchart of the study recruitment process

Statistical methods

The Shapiro-Wilk test assessed the distribution of variables, and due to the lack of a normal distribution, non-parametric tests were used. Qualitative variables of the changes in perinatal care experienced were compared using a chi-squared test with correction for low counts. A Kruskal-Wallis rank analysis of variance (ANOVA) compared the quantitative

variables of satisfaction with teleconsultations or e-consultations, and Tukey's post hoc test identified between-group differences. The statistical significance was a p-value <0.05. All calculations employed Statistica 13.3 (StatSoft Poland, Krakow, Poland).

Ethical consideration

Participation in the study was voluntary and anonymous. The study was conducted according to the principles of the Declaration of Helsinki and approved by the Bioethical Committee of the Centre of Postgraduate Medical Education in Warsaw, Poland (number of approval: 67/PB/2020).

Results

Study group's characteristics

The majority (n=367, 57.7%) of respondents used fee-for-service care, while one-quarter (n=164, 25.8%) used private healthcare insurance, and the rest (n=105, 16.5%) used NHF care. Those who used private healthcare insurance plans lived in larger cities more often (stat.) and had a university-level education. There were no between-group differences in marital status, with the overwhelming majority of women being married or in a relationship (Table 2).

Table 2. Sociodemographic characteristics of study participants (N=636)

Funding source / Characteristic category	Healthcare under NHF[a] (n=105) n (%)	Private healthcare insurance (n=164) n (%)	Fee-for-service healthcare (n=367) n (%)	p value
PLACE OF RESIDENCE				0.000*
Village	20 (20%)	15 (9%)	72 (20%)	
A city with up to 100 thousand inhabitants	18 (17%)	19 (11%)	89 (24%)	
A city with up to 250 thousand inhabitants	14 (13%)	11 (7%)	36 (10%)	
A city with up to 500 thousand inhabitants	11 (10%)	21 (13%)	31 (8%)	
A city with over 500 thousand inhabitants	42 (40%)	98 (60%)	139 (38%)	
EDUCATION				0.000*
Primary education	6 (6%)	0 (0%)	2 (1%)	
Vocational education	5 (5%)	0 (0%)	5 (1%)	
Higher education	30 (28%)	17 (10%)	50 (14%)	
University education	64 (61%)	147 (90%)	310 (84%)	
MARITAL STATUS				0.101
Married	73 (70%)	134 (82%)	294 (80%)	
Informal	31 (29%)	29 (18%)	71 (19%)	
Single or widowed	1 (1%)	0 (0%)	2 (1%)	
Other	0 (0%)	1 (1%)	0 (0%)	

[a] National Health Fund in Poland.
* p<0.05.

The mean age of the study participants was 29.9 years ±3.79 and varied between the funding source groups, with those who used NHF being significantly younger (28.31±3.75, p<0.001) than women who used private healthcare insurance (30.37±3.71) or fee-for-service healthcare (30.14±3.73).

Most women (n=615) received obstetrician-led care, with only 21 receiving midwife-led care or combined (obstetrician and midwife) care (Supplement Table 1).

Changes in maternity care

Most participants (n=608, 95.6%) experienced at least one change in maternity care provisions due to the COVID-19 pandemic. The most frequently reported change was banning partners and others from accompanying women to prenatal consultations (n=558, 87.7%). This was significantly more frequent for respondents using private healthcare insurance (p=0.001). Furthermore, those who used private healthcare insurance experienced more frequent consultation cancellations (p=0.000), fewer consultations (p=0.000), a shorter duration of prenatal consultation and/or fetal ultrasonography (p=0.019), fewer changes in obstetrician (p=0.000), and modifications to the form of consultation (p=0.004) compared to the other two groups. However, there were no significant differences between the different

Table 3. Changes in perinatal care during the COVID-19 pandemic (N=636)

Funding source / Change category	All participants (N=636) n (%)	Healthcare under NHF[a] (n=105) n (%)	Private healthcare insurance (n=164) n (%)	Fee-for-service healthcare (n=367) n (%)	p value
Partner not allowed during prenatal consultations	558 (87.7%)	80 (76%)	152 (93%)	326 (88%)	0.001*
Cancellation of scheduled prenatal consultations	196 (31%)	38 (36%)	87 (53%)	71 (19%)	0.000*
Cancellation of scheduled fetal ultrasonography and/or prenatal screening	81 (13%)	16 (15%)	26 (16%)	39 (11%)	0.174
problems accessing laboratory tests such as blood test	293 (46%)	37 (35%)	79 (48%)	177 (48%)	0.051
Difficulties accessing examinations such as fetal ultrasonography and/or prenatal screenings	92 (14%)	19 (18%)	33 (20%)	40 (11%)	0.010*
Change of obstetrician during a pregnancy	68 (11%)	7 (7%)	34 (21%)	27 (7%)	0.000*
Decrease in the number of prenatal consultations	170 (27%)	28 (27%)	78 (48%)	64 (17%)	0.000*
Shorter duration of prenatal consultation and/or fetal Ultrasonography	137 (22%)	19 (18%)	48 (29%)	70 (19%)	0.019*
No changes	28 (4%)	9 (9%)	1 (1%)	18 (5%)	0.006*

[a] National Health Fund in Poland.
* $p<0.05$.

modes of maternity care financing and the cancellation of scheduled fetal ultrasonography and/or prenatal screenings (p=0.174, Table 3).

Assessment of maternity care during the COVID-19 pandemic

The opportunity to ask questions was the highest-rated aspect of maternity care (8.23±2.32), while the feeling of safety was the lowest-rated (6.66±2.84) by all study participants.

Respondents who used private healthcare insurance were the least satisfied with all the aspects of maternity care compared to public and fee-for-service care users (Table 4).

In each of the questions in Table 4, Tukey tests for different counts showed statistically significant differences between the paid group and other groups. There were no statistically significant differences between the NHF and insurance groups.

Over half (n=351, 55.2%) of the study participants used teleconsultations or e-consultations during the COVID-19 pandemic. They assessed how these healthcare services reflected personal consultations. On a scale of 0–10, where 0 indicated "does not reflect at all" and 10 indicated "very much reflects," the average assessment of teleconsultations or e-consultations was 3.89. There was no significant difference between women using the different maternity care financing models (p=0.542, Table 5).

Table 4. Satisfaction with Maternity Care During the COVID-19 Pandemic (N=636)

Funding source / Assessment category	All participants (n=636)	Healthcare under NHF[a] (n=105)	Private healthcare insurance (n=164)	Fee-for-service healthcare (n=367)	p value
Feeling of safety	6.66 (±2.84)	6.52 (±3.05)	5.85 (±2.89)	7.07 (±2.68)	0.000*
The commitment of the medical staff	7.95 (±2.35)	7.59 (±2.57)	7.34 (±2.55)	8.32 (±2.12)	0.000*
Opportunity for questions	8.23 (±2.32)	7.87 (±2.57)	7.85 (±2.24)	8.50 (±2.24)	0.000*
Access to medical consultations/examinations	6.73 (±2.77)	6.40 (±2.90)	6.06 (±2.83)	7.13 (±2.64)	0.000*
Duration of medical consultations/examinations	7.12 (±2.86)	6.83 (±3.26)	6.21 (±2.94)	7.60 (±2.58)	0.000*

[a] National Health Fund in Poland.
* $p<0.05$.

Table 5. Assessment of teleconsultations and e-consultation for maternity care (N=351)

Funding source	All participants (N=351)	Healthcare under NHF[a] (n=49)	Private healthcare insurance (n=139)	Fee-for-service healthcare (n=163)	p value
Assessment of tele- or e-consultation (on a scale of 0–10)	3.89 (±2.44)	3.57 (±2.58)	3.86 (±2.39)	4.01 (±2.44)	0.542

[a] National Health Fund in Poland.

Discussion

Even before the COVID-19 pandemic, it had been shown that socioeconomic status and funding sources could impact perinatal care [23–27]. The participants of a study by B.L. Ayers and co-authors stated that a lack of insurance constrained their access to prenatal care [24]. E. Welder and co-authors observed differences in the average number of maternity care appointments and access to examinations in pregnancy between various Medicaid coverages in Iowa for immigrant women [27]. In 2014, Rogala and co-authors reported in their study among Polish postpartum women that the amount of maternity care services provided is higher in the private sector than in the public sector [25]. Similar experiences among women in Reggio Emilia Province (Italy) were described in the study of L. Bonvicini and co-authors. The respondents with fewer than 3 checkups during pregnancy, and late presentation at first checkups (after the 12th week of gestation) more frequently used public services [26]. The COVID-19 crisis has contributed to change in maternity care [9], as our study shows. The data analyzed by S.C. Handley and co-authors, concerning prenatal testing pre-pandemic and during it indicated changes such as a decreased number of women with first-trimester ultrasounds from two studied academic institutions or obtaining a fetal ultrasound in the later weeks of pregnancy [28]. In the study by D. Drandić and co-authors concerning Europe, it was observed that maternity care services, such as antenatal care appointments, were reduced overall across the countries studied, with the change being quite drastic in some countries. The numerous changes and difficulties in accessing maternity care occurred, especially during the first wave of the COVID-19 pandemic [29]. Whipps and co-authors also observed more changes reported in this area by pregnant women during the first wave than in the second wave of the pandemic [30]. The COVID-19 crisis may have entailed a worsening of the financial situation of many families. Therefore, the minimal fees for maternity care services may have been unaffordable and connected with the necessity to use public, free care by pregnant women [31].

Most studies describing the women's experiences associated with limitations in maternity care did not include the mode of healthcare service financing used [32–35]. An analysis of hospital databases in Pittsburgh (USA) by Facco and Himes showed that patients using Medicaid insurance experienced less care than patients with commercial insurance between April and July 2020 [36]. Another study, including women from the USA, indicated that respondents with Medicaid insurance more frequently canceled or delayed prenatal visits during COVID-19 than others [37]. Jakubowski and co-authors conducted a study in Poland between August and October 2020 and showed no difference in difficulties accessing services between patients receiving private (fee-for-service) and publicly funded care [2]. However, this study did not include private healthcare insurance as a separate group. Our results showed that the respondents using this mode of financing reported cancellation of scheduled prenatal consultations most often (p=0.000), a greater change in obstetricians during pregnancy (p=0.000), a decrease in the number of consultations (p=0.000), and a reduced prenatal consultation duration (p=0.019). These may be due to staff shortages and employment restrictions introduced to prevent the spread of the virus from one healthcare system to the other. In the report by the Childbirth with Dignity Foundation, concerning maternity care in Poland during the COVID-19 pandemic, it was observed that obstetricians and midwives reported limitations in taking on additional work in medical centers serving patients with healthcare insurances at the time [12].

The most frequently declared change (n=558, 87.7%) was banning partners from accompanying women to prenatal consultations, an issue experienced globally [38]. Among 46 surveyed prenatal facilities in Italy, 78.3% had kept fathers out of their partners' visits and exams [4]. Banning partners from participating in prenatal consultations impacted pregnant women and their partners, causing feelings of loneliness, loss, and anxiety [39–41]. A study from Sweden showed that women declared feelings of being left alone during times of vital pregnancy-related decision-making. Furthermore, missing out on the support of their partners was particularly strong in those who experienced pregnancy complications and had to attend extra antenatal checkups [39]. In a study conducted by Vasilevski and co-authors, partners of pregnant women were aware that they could not provide appropriate support and participate actively in maternity care, with some feeling isolated [40]. Despite engaging in various coping

strategies, such as sending photos and videos of fetal ultrasonography examinations, pregnant women and their partners felt the loss [39–41].

In our study, around one in three respondents reported cancellations of planned prenatal consultations and a decrease in their number. Similar experiences were reported by studies in other countries [7,41–43]. In Italy, the first country affected by the pandemic, only 28.4% of facilities continued to provide routine outpatient visits and examinations during the first wave [4].

Before the COVID-19 pandemic, telemedicine was rarely used in perinatal care [44], as physical examinations can be required during perinatal consultations. The pandemic forced the necessity of contact with obstetricians and midwives onto telemedicine. Therefore, the use of this method of communication became more common during this time. In the year before the COVID-19 pandemic, 9% of pregnant women in the state of Mississippi used telemedicine, which increased to 23.6% during the pandemic (n=1894) [45]. Such an increase was achievable using existing infrastructure.

In Poland, before the pandemic, telemedicine was mainly used for specialized disciplines, such as cardiology, primary care, and pathology, and only sporadically for obstetrics [46,47]. In the current study, more than half (n=351, 55.2%) of respondents declared using teleconsultations or e-consultations during the COVID-19 pandemic. Similar results were described in a study by Jakubowski and co-authors between August and October 2020 in Poland, in which 47.41% (n=293) of those surveyed had at least one telehealth appointment during pregnancy [2]. For some women, teleconsultations increased their access and flexibility to health services and constituted a positive experience. They usually assessed that their problems were completely or largely solved by using telemedicine and felt completely or mostly satisfied with this practice. Others perceived them as non-personal appointments due to the limitation of physical contact with medical staff [39,41,48]. Despite the advantages of teleconsultations, pregnant women preferred in-person medical appointments [49], as observed among our respondents, who scored teleconsultations or e-consultations low (M=3.89 on a scale of 0–10).

Telehealth was rarely used by persons receiving government-issued insurance plans in the USA [50]. In Poland, one of the biggest healthcare companies with private healthcare insurance options introduced telemedicine services over ten years ago [51]. Among the respondents who had teleconsultations or e-consultations during the COVID-19 pandemic, most used private healthcare insurances (n=139, 39.6% of all recipients). This finding may be due to the fact that the healthcare insurance providers already had years of experience in telehealth, and it was simpler for them to implement these services during the epidemiological crisis.

Despite various restrictions related to the COVID-19 pandemic, women and/or their partners were generally satisfied with the quality of care provided by medical staff [5,39], with the support positively assessed by patients [7,52]. In a study by Linden and co-authors, most pregnant Swedish women highlighted that their midwives were caring and compassionate [39]. Javaid and co-authors noticed that the quality of maternity care did not change for some respondents, and they felt supported by their maternity care providers [42]. For change, the interviewees from the study of D. Drandić stated that the quality of care was compromised as a result, especially in European countries where the quality of care was already low or varied before the pandemic [29]. In our survey, various aspects of maternity care were rated quite well (Table 4), with all respondents assessing the "commitment of the medical staff" highly (M=7.95±2.35) during the COVID-19 pandemic.

Women highlighted the educational role of medical staff in both maternity care and SARS-CoV-2 [5,42]. In a study by Bradfield and co-authors, one in seven Australian women felt they received clear and timely answers to questions about COVID-19's impact on them and their babies [5]. However, they noted inconsistency in the information given by medical staff concerning COVID-19 [53] or that doctors focused on questions about the COVID-19 pandemic rather than their perinatal period [42]. Our respondents had no issues receiving information from medical staff and rated the "opportunity for questions" highly (M=8.23±2.32). Similar perceptions were found in Swedish respondents regarding support from their midwives [39].

Limitations

We did not collect data on the respondents' COVID-19 status. Being infected with SARS-CoV-2 during pregnancy may have influenced opinions on maternity care and difficulties accessing healthcare services. However, other studies demonstrated similar perceptions of quality care between infected and uninfected women [54].

Conclusions

The COVID-19 pandemic affected the women's experiences of receiving maternity care, with the mode of medical service funding differentiating their experiences. In a crisis, attention should be paid to the availability of maternity care services for women with disparate funding arrangements, and care

should be planned to avoid inequalities in access to services. An increase in the use of telemedicine for perinatal care during the SARS-CoV-2 pandemic may provide a beneficial solution for future crises.

Supplement Table 1. Financial management of pregnancy (N=636)

Funding source / Maternity care provider(s)	All participants (N=636) n (%)	Healthcare under NHF[a] (n=105) n (%)	Private healthcare insurance (n=164) n (%)	Fee-for-service healthcare (n=367) n (%)
Obstetrician	615 (97%)	89 (85%)	162 (99%)	364 (99%)
Midwife	8 (1%)	3 (3%)	2 (1%)	3 (1%)
Obstetrician + midwife	13 (2%)	13 (12%)	0 (0%)	0 (0%)

[a] National Health Fund in Poland.

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