

**FULL PAPER**

# Analysis, possible dangers caused by influenza in pregnant women in Guayaquil (Hospital del Guasmo)

Federico Puertas<sup>a</sup> | Rivieliño Ramón-Curay<sup>b,\*</sup>  | David Santiago Agualongo Chela<sup>c</sup>  | Clara Patricia Guerra Naranjo<sup>c</sup> 

<sup>a</sup>Universidad Espíritu Santo, Facultad de Ciencias Médicas, CP: 090101, Guayaquil (Ecuador)

<sup>b</sup>Universidad Estatal de Bolívar, Facultad de Ciencias Agropecuarias, CP: 020150, Guaranda (Ecuador)

<sup>c</sup>Universidad Estatal de Bolívar, Facultad de Ciencias de la Salud y del Ser Humano, CP: 020150, Guaranda (Ecuador)

Influenza, a respiratory viral disease, presents a grave concern due to its substantial impact on health, often resulting in severe illness and even death. Pregnant women, a vulnerable population, face particular risks when exposed to influenza. This study aimed to assess the potential dangers posed by influenza to pregnant women at Guasmo Hospital in Guayaquil. To achieve the aim of this study, a comprehensive survey was administered to a cohort of 200 pregnant women utilizing the G-Suite platform, allowing for efficient data collection and analysis. The findings revealed that 48% of participants fell within the 18-25 age group, with a concerning 44% reporting that they had not received any guidance regarding influenza vaccination. Alarming, a majority of respondents, comprising 67%, had not received the influenza vaccine during their pregnancy, despite 38.7% acknowledging its advisability during this critical period. Furthermore, more than half of the surveyed women remained unaware of the potential risks associated with forgoing vaccination. It is evident that misinformation persists among pregnant women, leaving them susceptible to the dangers of influenza. Addressing this knowledge gap is imperative to ensure the well-being of both expectant mothers and their unborn children.

**\*Corresponding Author:**

Rivieliño Ramón Curay

Email: [fbayas@ueb.edu.ec](mailto:fbayas@ueb.edu.ec)

Tel.: + 593990316224

**KEYWORDS**

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**Introduction**

Influenza viruses are members of the Orthomyxoviridae family. This family represents enveloped viruses whose genome consists of segmented negative-sense single-stranded RNA segments. There are four genera of this family: types A, B, C and Thogotoviruses, of which, however, only genera A and B are clinically relevant to human [1]. Influenza virus

(IV) remains of great importance as it represents an imminent threat, as influenza A viruses are clinically the most important viruses responsible for severe epidemics in humans and domestic animals.

The virus causes respiratory disease in humans that can lead to severe pneumonia and ultimately death. The high mutation rate combined with the high rate of replication allows the virus to adapt easily to changes

environmental. This may eventually lead to the generation of a virus with the ability to replicate in human and with novel antigenic properties that may be the cause of a pandemic outbreak [2].

In Ecuador, influenza is an endemic disease with a high transmission rate. In Ecuador, this virus has a higher rate of cases during the rainy season of the year (December to May). According to the Ministry of Public Health, the last epidemiological cut-off (2017-2019) in our country 1730 cases of influenza were reported of which 143 were fatal reaching a lethality of 2.7%. Our country has currently implemented vaccination campaigns against influenza, prioritizing groups most vulnerable to this disease (people with severe acute respiratory infections "IRAG", pregnant women, people over 65 years of age, children under 5 years of age and patients with chronic diseases). Influenza vaccination is an essential element of care for high-risk groups [3].

Influenza (flu) is more likely to cause severe illness in pregnant women than in women of childbearing age who are not pregnant. Changes in the immune system, heart, and lungs during pregnancy make pregnant women (and women up to two weeks postpartum) more prone to serious illness from influenza, including illness resulting in hospitalization; influenza can also be harmful to a pregnant woman's developing baby [4,5]. A common symptom of flu is fever, which can be associated with neural tube defects and other adverse outcomes for a developing baby. Getting vaccinated can also help protect an infant from influenza after birth (the mother passes antibodies to the developing baby during her pregnancy) [6].

Influenza virus vaccination should be pre-pregnancy, prenatal, and postpartum because influenza can cause severe illness, including an increased likelihood of progressing to pneumonia, when it occurs during the antepartum or postpartum period. In addition to hospitalization, pregnant women with influenza are at increased risk for intensive

care unit admission and adverse perinatal and neonatal outcomes [7]. On the other hand, another issue associated with influenza-caused lethality is in mothers who smoke; when the mother's lungs are exposed to influenza or other infections, the adverse effects of smoking or vaping are much more severe than among people who do not smoke or vape. Smoking is associated with increased development of acute respiratory distress syndrome (ARDS) in people with a risk factor such as severe infection<sup>8</sup>. People who have some cotinine (a metabolite of nicotine) in their bodies, even at the low levels associated with secondhand smoke, have a substantially increased risk of acute respiratory failure from ARDS [8,9].

Concerning the background described above, the hypotheses raised were:

Pregnant women in Guayaquil, Ecuador, are at a higher risk of severe illness and adverse outcomes from influenza compared to non-pregnant women of childbearing age.

The prevalence of influenza-related complications, such as pneumonia and hospitalization, is higher among pregnant women who smoke or vape compared to non-smoking pregnant women.

Implementation of vaccination campaigns targeting pregnant women can significantly reduce the incidence of influenza-related morbidity and mortality in Guayaquil.

The objective of this study was, to analyze through a survey of pregnant women about the dangers that influenza can cause in their state, and to generate awareness of the importance of being vaccinated against this disease.

## Experimental

The methodology applied in the research was based on exploratory, descriptive and deductive methods based on scientific reading techniques and surveys with the use of a questionnaire of 12 validated questions. The surveys were conducted online through the Gmail G-Suite platform from March 2 to 14, 2020. The research was conducted with the

participation of 200 pregnant women from the city of Guayaquil (mostly from the Guasmo Hospital in Guayaquil).

## Results and discussion

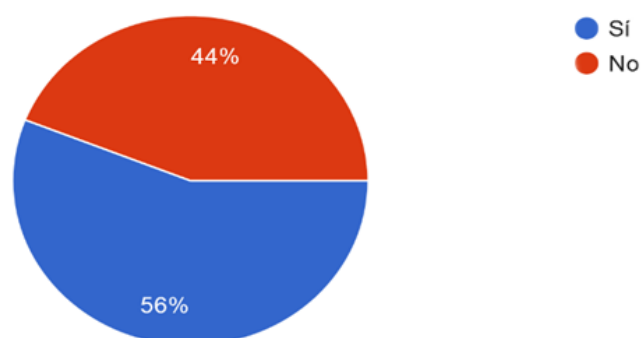
After applying the questionnaire to 200 pregnant women in Guayaquil (Ecuador), mostly from the Guasmo Hospital, 48% of the women in the study were between 18 and 25 years of age, followed by 29.5% of women between 25 and 35 years of age. Forty-eight percent of the women in the study were between 18 and 25 years of age, followed by 29.5% of women between 25 and 35 years of age. In addition, 36% of the women surveyed were in the second trimester of gestation, 33.2% in the first trimester, and 30% in the third trimester.

Regarding the comorbidities of the pregnant women, 60% of those surveyed had no comorbidities, while only less than 10% suffered from other disorders. In addition, more than 65% do not have smoking habits; however, 32.5% say they have smoked even during pregnancy. It should be noted that previous studies by Gutiérrez Paternina *et al.* [8] and Kataoka *et al.* [10], suggest that smoking during pregnancy can cause premature births, birth defects, or death due to sudden infant death syndrome (SIDS).

It is of concern to know that 44% of the respondents say that they have not received recommendations about being vaccinated against the influenza virus (Figure 1). Also, 67% of the women in the analysis reported that they had not been vaccinated against the disease during pregnancy.

Le han recomendado vacunarse contra el virus de la influenza

200 respuestas

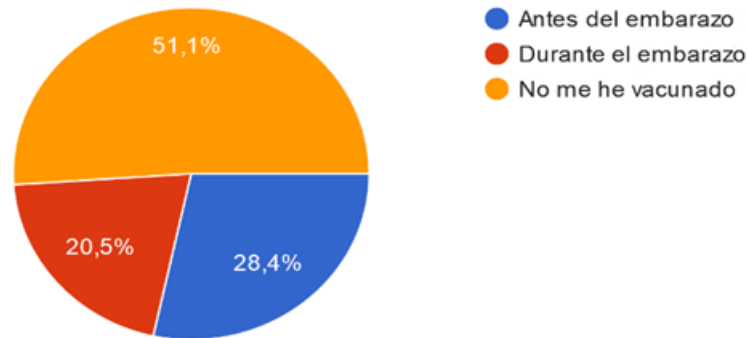


**FIGURE 1** Patients recommended for influenza virus vaccination

58.1% of the women surveyed did not know about the annual application of the influenza vaccine. It is worth noting how important it is for women to know about vaccination, given that getting vaccinated has multiple benefits, including: avoiding contracting the disease (Influenza vaccination prevented some 7.52 million cases of the disease, 3.69 million consultations, 105,000 hospitalizations and 6,300 deaths from influenza); it can reduce the risk of hospitalization; it helps protect women

during and after pregnancy and reduces the risk of death from influenza children [11]. Thus, despite the benefits of the influenza vaccine, it is alarming to know that of the 200 pregnant women surveyed, more than 50% have not received the influenza vaccine before or during pregnancy in the last year (Figure 2), despite the fact that 38.7% say that it is advisable to receive the vaccine during pregnancy; however, 29% of respondents say they have not.

Se ha vacunado antes o durante el embarazo en el último año?



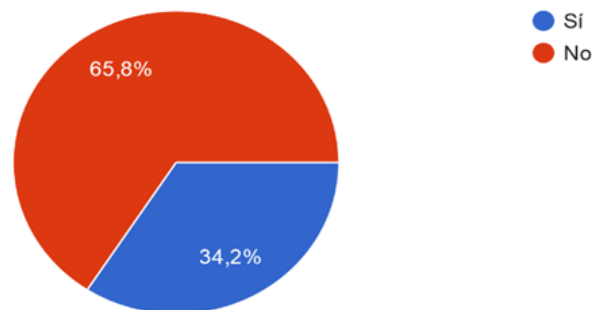
**FIGURE 2** Influenza vaccination in the past year; In addition, most respondents were unaware of the cost of influenza vaccination.

#### *Risks of not being vaccinated against influenza*

By not being vaccinated against influenza, health complications caused by influenza, such as pneumonia, can be serious and even fatal, especially if pregnant, as well as problems such

as preterm labor and premature birth can also occur [12]. However, more than 60% of women surveyed do not know about the potential risks of not being vaccinated against this disease during pregnancy (Figure 3).

Conoce usted los posibles riesgos de no estar vacunado contra influenza durante el embarazo



**FIGURE 3** Potential risks of not being vaccinated against influenza

Similarly, only 21.1% know that non-vaccination could cause fetal malformation, followed by 19% who say it causes a normal flu and 59% who do not know at all.

#### **Conclusion**

In summary, this study highlights the lack of awareness and adherence to influenza vaccination among pregnant women, pointing out the urgency of educational strategies. Lack

of information and low vaccination rates raise concerns due to the risks associated with influenza during pregnancy. Future research is suggested to evaluate the effects of vaccination on the prevention of influenza and its complications in this population, which could inform more effective public health policies for the well-being of pregnant women and their unborn children. In general, this study lays a solid foundation for future improvements in influenza-related health of pregnant women.

Likewise, additional studies would be advisable to understand the reasons behind the low rate of influenza vaccination in pregnant women. This would help develop effective interventions to address lack of awareness and mitigate the risks associated with influenza during pregnancy.

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### Authors' Contributions

Federico Puertas contributed to the search for information and tabulation of data, Rivieliño Ramón-Curay collaborated in the interpretation and translation of results, David Santiago Agualongo Chela collaborated in the development of surveys and the statistics of the document, finally, Clara Patricia Guerra Naranjo collaborated efficiently in the translation and discussion of the information obtained.

### Conflict of Interest

The authors declare that they have no conflict of interest.

### Orcid:

Rivieliño Ramón-Curay\*:

<https://orcid.org/0000-0001-6284-4223>

David Santiago Agualongo Chela:

<https://orcid.org/0000-0002-8705-2609>

Clara Patricia Guerra Naranjo:

<https://orcid.org/0000-0002-6477-1539>

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