

Births Through British Columbia's Covid-19 Pandemic

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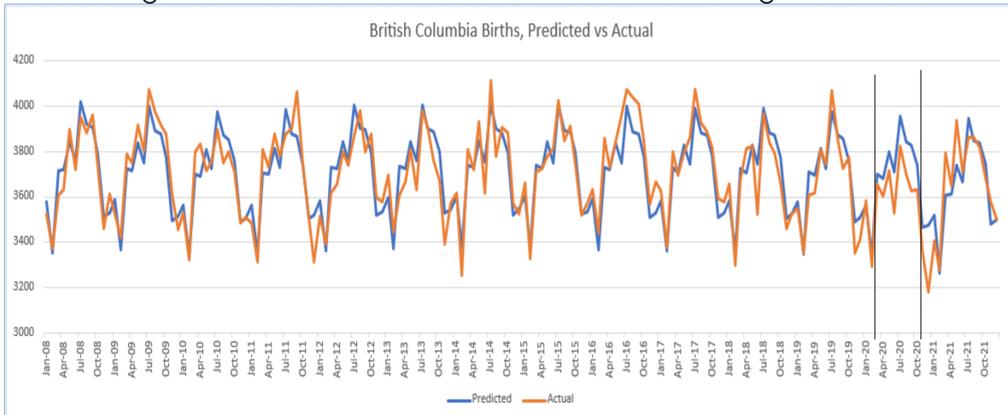
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Abstract

At the onset of the pandemic, many journalists predicted a baby boom: with people stuck at home, so the reasoning went, couples would be spending more quality time together. However, in December 2020, 9 months after the first lock down in BC due to the COVID 19 pandemic, we observe a drastically lower number of births than in the same month a year before. Using information gathered on government sites for monthly births by local health area (LCA) (BC Vital Statistics, 2020-2022), yearly population (StatCan, 2021), and unemployment rates (StatCan, 2021), and using local public newspapers for lockdown and travel restriction severity, we perform several regressions that help us determine how the pandemic changed birth rates. Creating a forecasting model for the expected birth rates had the pandemic not happened, for 2020 and 2021, we show different trends based on different census metropolitan areas and British Columbia overall. From November 2020 to December 2021, we find that approximately 95 births are missing in BC overall but there is quite a bit of regional variation, with a missing 1114 births in Vancouver, 47 missing births in Victoria, 100 extra births in Abbotsford/Mission, and 280 extra births in Kelowna.

Research

We run two different categories of regressions. One regression we ran used the pre-pandemic data (2008-2019) to forecast what should have been the expected births in BC, keeping the unemployment rate (StatCan, 2022) as it was throughout the pandemic. The other regression includes the pandemic months (2008-2021) and considers that the opportunity to meet nine months prior to the birth of a child, or travel restrictions at the current time; both factors are statistically significant when used without the other. The forecasting model seems to be the better model in terms of goodness of fit.

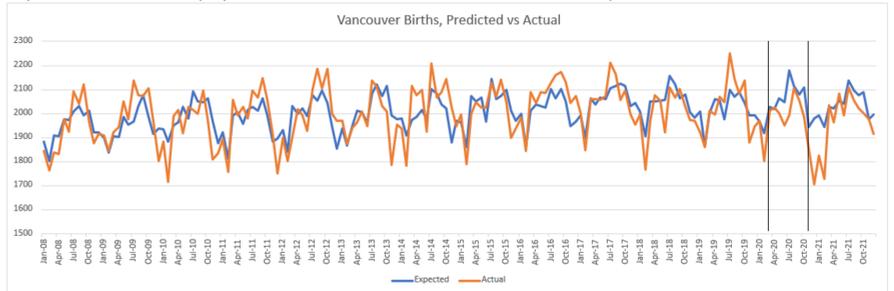


Above shows the British Columbia predicted versus actual birth graph, with a vertical line at the onset of the pandemic in March 2020, and a vertical line in November 2020 to show the start of the births that would have included the pandemic as a factor in the parents decision on whether or not to have a child. The model does a very good job predicting the births prior to 2020, but we can observe that the early months of the pandemic started having fewer births than predicted even though Covid-19 would not have been a factor at the time of conception. According to StatCan (2021, September 28), 2020 was a record year for stillbirths since 2007 (StatCan, 2021) so this could partly explain the difference. Another theory is that with lower travel, birth tourism effects could have been lower (Keiran, 2022); we would expect to see fewer births throughout the 2020 pandemic months in the popular tourist cities, such as Vancouver and Victoria, which is what we observe. It is very difficult to tell how big of a role the lack of birth tourism played in these missing births since the data on births we gathered from the British Columbia government (2020-2022) claimed that it was showed the LCA of the mother, but we do not have data on whether foreigners were able to claim that LCA as their place of residence or not, and how that data was gathered and entered. A third theory is that there are still more births being reported after the time of publication, so the reported number don't include all the actual births. In our regression, we also included a time trend. In 2007, the average woman was giving birth to 1.52 children. In 2020, that number dropped to 1.17 (StatCan, 2021), demonstrating that there is a downward trend in fertility even in the absence of the pandemic.

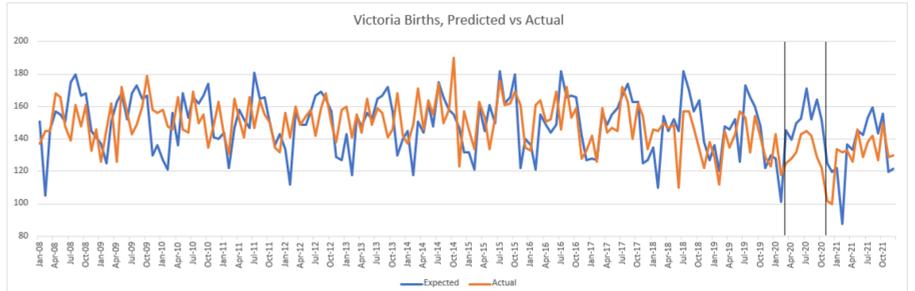
A question we are unable to answer with the current data is how the demographics of mothers giving birth changed throughout the pandemic. Unfortunately, the data on demographics for British Columbia births in 2021 are not available yet, so we are unable to see how the pandemic affected the demographics of who decided to go through with pregnancy, and who decided to hold off. For every 5 year age group under 30, the fertility rate has consistently been falling since 2007 (StatCan, 2022). We would expect to see this trend continue, and accelerate during the pandemic. We would like to answer the question on how the demographics of births changed in BC with this data, since all of 2021 births would have a conception during the pandemic.

Missing Births by Region

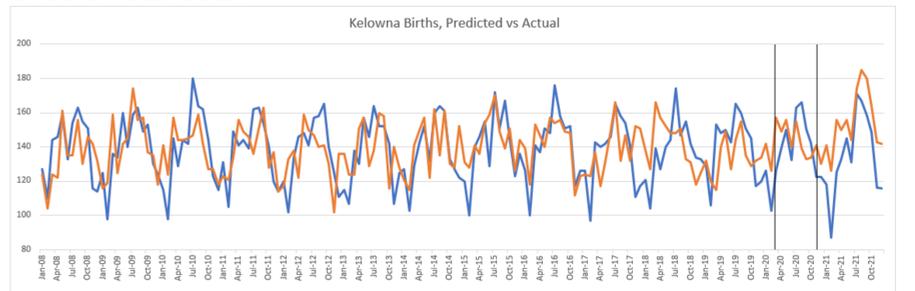
During the second and third quarter, Vancouver experienced a lower birth rate than predicted. There was a very sharp drop in births from December 2020-February 2021, which correlates with conceptions at the onset of the pandemic. Unlike overall British Columbia, Vancouver did not see the same baby boom after the initial negative shock to the system, but simply returned to the trend that we predicted.



Victoria seems to have followed a different trend than expected. Victoria births were low in the last three quarters of 2020, then spiked in the three months corresponding to conceptions at the onset of the pandemic, before returning to roughly the expected births.



Kelowna is the most abnormal CMA in comparison to other CMA's and British Columbia. Our model predicts a negative shock to the system 9 months after the onset of the pandemic; however, the trend does the opposite and there is a baby boom. Unlike other CMA's or British Columbia, Kelowna's baby boom does not end after a couple months but rather continues for the next year, with 185 births in August 2021, an all time high since at least 2008.



In conclusion, the Covid-19 pandemic affected births differently across different regions throughout British Columbia whether that was a baby boom, several missing births, or a mixture of both. More research needs to be done on the consistently low births throughout the last three quarters of 2020 throughout the whole province and its CMAs, but there seems to be a strong correlation between the onset of the pandemic and anomalies in births nine months later. For British Columbia as a whole, between November 2020 and December 2021, there were only an estimated 95 "missing" births, which is quite small when there were 50633 births in that same period. For BC overall, the Covid-19 pandemic did not really change overall births, however regions like Vancouver and Victoria saw a decrease in births, and Kelowna and Abbotsford/Mission experienced an increase in comparison to the forecast.

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