

# Strategically Timed Preventive Education and Media Strategies Reduce Seasonal Trends in Adolescent Conception



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## ABSTRACT

**Study Objective:** This study sought to analyze the effect of strategically timed local preventive education on reducing teen conception rates during known seasonal peaks in March and April.

**Design:** All teen conceptions (age  $\leq 19$ ) from March and April 2010, 2011, and 2012 were identified using medical records data. Teen conceptions occurring in January 2010, 2011, and 2012 were also identified to control for any new trends in the community.

**Setting:** A city of 160,000 with 1 tertiary care centre.

**Participants:** Pregnant adolescents (age  $\leq 19$ ).

**Interventions:** During the month of February 2012, preventive education and media awareness strategies were aimed at parents, teachers, and teens.

**Main Outcome Measures:** Adolescent conceptions in March and April 2012.

**Results:** Conception rates in teens  $\leq 18$  years old were significantly reduced in March and April 2012 compared to March and April 2010 and 2011 (RR = 0.53, 95% CI = 0.32 - 0.88,  $P = .0132$ ). There was an increase in conceptions in March and April 2012 compared to 2010 and 2011 among 19-year-olds (RR = 1.57, 95% CI = 0.84-2.9,  $P = .1500$ ). Effect modification revealed our  $\leq 18$ -year-old group and our 19-year-old group were distinct groups with different risk estimates ( $P = .0075$ ).

**Conclusions:** Educational sessions were poorly attended and contraception clinic volume was static. We propose increased parental supervision in response to media reminders as a possible explanation for the reduction in adolescent conceptions ( $\leq 18$  years old) seen in March 2012.

**Key Words:** Adolescent conception, Teen pregnancy prevention, Adolescent pregnancy, Contraception, Seasonal trends, Education through media, Public health

## Introduction

Despite the overall decline in teenage pregnancy rates in industrialized nations such as Canada, the U.S., England, and Wales,<sup>1</sup> adolescent childbearing continues to be an important health determinant for both teen mothers and their offspring. Teen conception rates in Canada (including births, miscarriages, and induced abortions) were reported to be 24.6/1000 in 2005.<sup>2</sup> In the U.S., teenage pregnancy rates continue to be more than double those of Canada despite numerous efforts to decrease the occurrence.<sup>1,3</sup>

The adverse outcomes associated with adolescent pregnancy have been established.<sup>3</sup> Teen mothers are more likely to attend an inadequate number of prenatal care visits<sup>4</sup> and are less likely to take folic acid prior to their pregnancy.<sup>5</sup> Teen mothers are also at a higher risk of gaining an inadequate amount of weight during their pregnancy<sup>4</sup> and have lower breastfeeding initiation rates and duration.<sup>5</sup> Adolescent mothers are more likely to develop mental health problems such as depression<sup>5,6</sup> and are at a higher risk of experiencing partner violence including physical and/or sexual abuse in their lifetime.<sup>5,7</sup> Furthermore, teenage

mothers tend to have a lower socioeconomic status<sup>6,7</sup> and are more likely to be single parents.<sup>7</sup>

Children of adolescent mothers have been shown to have an increased risk of death during infancy, school-aged years, and adolescence, as well as an increased risk of hospitalization.<sup>8</sup> They have also been shown to have poorer educational achievement,<sup>8,9</sup> lower socioeconomic outcomes,<sup>8,9</sup> and decreased life satisfaction.<sup>9</sup>

Seasonal trends in conception rates have been established in both adult and adolescent populations in North America.<sup>10-14</sup> When investigating adolescent conception trends in a university and military town in Ontario, Canada, Turnbull et al<sup>11</sup> identified a significant and consistent seasonal peak in adolescent conceptions (age  $\leq 18$ ) during the month of March that was not seen among adults in this community; this finding was consistent for 5 consecutive years (2004 - 2008). The aforementioned peak in adolescent conceptions was termed the "March Break Phenomenon" by local and national media who postulated that the spike in teen pregnancies could be due to a lack of supervision and an increase in risk taking behavior during Spring Break (occurring in March).

Numerous preventive education strategies have been shown to be effective in reducing adolescent conceptions in various communities.<sup>15-18</sup> Timing such strategies to reduce seasonal peaks in conception has yet to be investigated. The present study sought to analyze the effect of strategically

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timed local preventive education on reducing school-aged Canadian teen conceptions during the known seasonal peak in March, and identify any lingering benefit in April. This study took place in the same community described by Turnbull et al.<sup>11</sup>

## Methods

This study was conducted in a university and military town of approximately 160,000 in Ontario, Canada (Statistics Canada, 2011). This community has 2 sister hospitals, one of which is a tertiary care centre, which share an electronic patient care system that tracks utilization data from both sites. The health care system in Canada is publicly funded including access to gynecologic, prenatal, and obstetrical care. There were no recognizable changes of access to care over the study period.

During the month of February 2012, preventive education and awareness strategies were aimed at parents, teachers, and teens. A targeted media campaign was carried out consisting of a press release to local media reminding them of the “March Break Phenomenon” that had previously received widespread media attention in the community in 2011. This resulted in local media interviews on radio and television, and print articles in the only local newspaper. All local radio stations reported on the “March Break Phenomenon” over a 2–3 day period in late February, 2012. The local newspaper printed one article, also available online, and there were 3 television reports/interviews with the Contraception Advice Research and Education Fellow (C.A.R.E. Fellow). The media campaign encouraged parents and teens to attend educational sessions presented by local physicians on “Talking to your teen about sex” and “The realities of teen pregnancy,” which were hosted by the sole local public health unit. Increased access to walk-in contraception clinics, through extended hours, was also offered through the public health unit during the month of February and into early March 2012. Public health nurses who provide care in the local public high schools were allowed to send home announcements about the upcoming educational sessions and contraception clinics.

Following our intervention, and using search strategies identical to those described by Turnbull et al,<sup>11</sup> all adolescent conceptions from March and April 2012 were identified using a retrospective chart review. To control for any new trends in the community, all teen conceptions occurring in March and April 2010 and 2011 as well as teen conceptions in January 2010, 2011, and 2012 were also identified. Electronic medical records data was used to identify all pregnancies ( $\leq 20$  years old) from December 2009 to February 2013 presenting to the only 2 hospitals in the studied catchment area. Estimated date of conception and age at conception were then calculated using a formula identical to that of a standard pregnancy wheel (see below). Adolescent (age  $\leq 19$ ) conceptions during the months of interest were identified from this data pool.

Data included all births, terminations, spontaneous abortions, and ectopic pregnancies in women  $\leq 18$  years of age presenting to the only 2 hospitals in the region's catchment area. Teen conceptions (age = 19) in March and

**Table 1**  
Pregnancies Included and Not Captured

Pregnancies Included:
Pregnancies ended before 20 wks gestation:
Spontaneous abortion
Ectopic pregnancy
Therapeutic abortion/termination
Pregnancies continued to greater than 20 weeks gestation:
Live delivery (vaginal or surgical)
Stillbirth
Pregnancies Not Captured
Spontaneous miscarriages without need for medical attention
Home births without any hospital intervention (including imaging)

For age at conception > 20 years.

April 2010, 2011, and 2012 were also collected in the same way to assist with interpreting the cause of post intervention findings in  $\leq 18$ -year-olds. Research Ethics Board approval was obtained prior to beginning data collection.

All pregnancies included in this study are described in Table 1. Pregnancies that did not result in at least 1 hospital visit were not accounted for in this study.

Estimated date of conception was calculated based on gestational age, determined using medical records, last menstrual period, or ultrasonographic reports depending on the pregnancy, and then assuming conception took place at 2 weeks “gestational age.” Conceptions in March and April 2012 were plotted by month and compared to those in March and April 2010 and 2011 when no formal preventive education was offered. January data was plotted to control for annual trends in the community.

A Poisson regression was used to determine differences in conception rates in March and April 2010 and 2011 compared to March and April 2012.

## Results

A total of 134 adolescents (age  $\leq 18$ ) and 41 adolescents (age = 19) conceived during our study periods of interest; see Tables 2 and 3. Total annual adolescent conceptions (age  $\leq 18$ ) were 159 in 2010, 162 in 2011, and 137 in 2012. At least 1 visit was required to identify conceptions in this study.

As previously described, preventive education and awareness strategies aimed at parents, teachers, and teens in February 2012 consisted of a targeted media campaign, educational sessions, and increased contraception access through extended hours at the public health unit clinics. Two simultaneous sexual health and contraception educational sessions were offered on a single weeknight and on a Saturday. One was intended for parents, teachers, and public health nurses, while the other was dedicated to teens themselves. To increase timely access to contraception, the routinely held contraception clinics at the public health unit (2–3 per week) extended their hours; this was advertised through the media campaign. Less than 10 adults attended the session dedicated to parents, teachers, and nurses. A total of 3 adolescents attended the teen forum. Contraception clinics did not experience an increase in clinic volume.

Fig. 1 shows adolescent conceptions (age  $\leq 18$ ) in January, March, and April 2010, 2011, and 2012. Conception rates in teens  $\leq 18$  years old were significantly reduced in March and April 2012 compared to March and April 2010 and 2011

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