

British Columbia's Criminal Abortion History, 1922-1949: A Critique of the Evidence and Methods in the Work of Angus and Arlene Tigar McLaren

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In 1985 the McLarens published pioneer work in *BC Studies* on British Columbia's abortion history, and in 1986 their article became part of a book, *The Bedroom and the State*.¹ If valid, their research findings have important implications for our understanding of history and also current debates about the legal status of induced abortion. According to the authors, our conventional wisdom underestimates the historical popularity of abortion as a method of birth control and also the riskiness of the method, measured in abortion-related deaths. We have misunderstood tradition, the McLarens suggest, because of imperfect statistics. Stigmatizing abortions, which had the status of criminal acts, physicians underreported them. Disarmed by the bad data, the historical public and then later generations succumbed to "social amnesia — the failure of one generation to remember the experiences of an earlier one."

To cure the "social amnesia" the McLarens probe deficiencies and ambiguities in the available data and then estimate more accurate totals. They find that abortion-related deaths accounted for about 30 per cent of maternal deaths for the 1922-49 period, and that a rise in abortion rates in the 1930s and 1940s significantly slowed the fall in the maternal mortality rate. On the strength of such numbers, the McLarens find "that enormous numbers of women were seeking by risky and illegal methods to terminate their pregnancies," and they conclude:

Although the various agencies we investigated did not, in underreporting abortion, set out deliberately to deceive or mystify, that was their final effect. The statistics that resulted therefore had an ideological colouring; the importance of the need for safe, legal abortions could not be fully appreciated while the

¹ Angus McLaren and Arlene Tigar McLaren, "Discoveries and Dissimulations: the Impact of Abortion Deaths on Maternal Mortality in British Columbia," *BC Studies* 64 (Winter, 1984-85): 3-26; Angus McLaren and Arlene Tigar McLaren, *The Bedroom and the State, the Changing Practices and Politics of Contraception and Abortion in Canada, 1880-1980* (Toronto: McClelland and Stewart, 1986), 41-53.

numbers of women who died as a result of the illegal abortions was [sic] concealed.

The McLarens' article has three purposes, two explicit (p. 4) and one implicit (p. 26): i. to demonstrate that high rates of abortion and abortion-related deaths found in Ontario in 1934 were "not an isolated phenomenon" and also obtained in British Columbia; ii. "to reveal how an analysis of the relationship of abortion deaths to all maternal deaths raises methodological issues that must interest those who use quantitative evidence"; and iii. to establish through historical evidence "the importance of the need for safe, legal abortions."

This critique examines five aspects of their research: the definition of abortion, the data on abortion deaths in B.C. vital statistics, corrections to published statistics to compensate for the incomplete reporting of abortion deaths, the contribution of abortion deaths to maternal deaths, and the relationship between abortion deaths and criminal abortions. The critique serves two purposes. First, it shows that the McLarens mishandle the methodological issues and, in particular, analyze the wrong abortion deaths. Second, it builds on the McLarens' work to elaborate the methodological issues and obtain more satisfactory evidence for the issues they raise.

The Definition of Abortion

Abortion (or *miscarriage*) entails "the premature expulsion from the uterus of the products of conception (the embryo or a nonviable fetus)." Where a dead-born fetus is viable, the birth event is classified a *stillbirth* and, unfortunately for historians, the criteria for the stillbirth classification change through time.² The age of viability was considered to be six months until 1932, twenty-eight weeks (6.5 months) during the period 1932-61, and then twenty weeks (five months) after 1961. Thus an increase in *reported* abortions after 1932 and a decrease after 1961 partly reflects change in the definition of stillbirth rather than *real* change in the numbers of abortions.

Abortions are *spontaneous* (occurring naturally) or *induced* (brought on by human intervention). Induced abortions receive additional social definition: they are either *legal* (given for medical or therapeutic reasons) or *criminal*. Although popular understanding equates *abortion* with *induced abortion*, spontaneous abortions are the more numerous. According

² H. Lukin Robinson, "Rates of Stillbirths in Canada," *Canadian Journal of Public Health* 38 (April 1947): 168-81; Ontario, *Annual Report of the Registrar-General for 1985*, 15.

to one authority, "about three quarters of all conceptions are aborted, most of them because they are abnormal" — in effect, spontaneous abortion is nature's way of maintaining genetic stability.³

The McLarens seem unaware of the distinction between spontaneous and induced abortion. Their language makes no such distinction, and they treat all deaths reported in the *abortion category* of vital statistics as deaths from *induced* abortion, even though some of the abortions are described as "spontaneous or unspecified."⁴ At a minimum, the assumption that 100 per cent of deaths in the category came from *induced* abortions is a major, contentious analytical decision which requires explanation.

The Reporting of Abortion Deaths in Vital Statistics

The McLarens found a sharp increase in reported abortion deaths between the 1926-30 and 1931-40 periods. "It would appear," they suggest, "that some reform in the classification system took place in the early 1930s. . . . The reported surge must have been at least in part a product of new methods of reportage and recording" (p. 17).

Here the McLarens' observation is apt, but they do not pursue it. Consequently they fail to learn how historical vital statistics report abortion deaths and therefore miss some of them, including criminal abortion deaths, which are not reported in the *abortion category*.

As part of a national civil registration system, B.C. Vital Statistics used an adaptation of the *International List of Causes of Death* to classify deaths by cause. Established in 1893, the *International List* was periodically revised (1900, 1909, 1920, 1929, 1938, 1948, 1955, 1965, 1975). To interpret correctly provincial vital statistics, one must determine the years to which each revision applies. Then, for each set of years, one must consult the pertinent revision of the *Manual of the International List of Causes of Death* to see how abortion deaths were reported.⁵ B.C. Vital

³ C. J. Roberts and C. R. Lowe, "Where Have all the Conceptions Gone?," *Lancet* (1 March 1975): 498-99.

⁴ Of the fourteen abortion deaths which they report for the 1956-59 period, for example, five are described as *spontaneous or unspecified*. Medical sources perhaps led the McLarens astray. In "Abortion Deaths in British Columbia, 1955-1968," *B.C. Medical Journal* 12, 5 (May 1970): 111-12, Dr. W. D. S. Thomas deals exclusively with *induced abortions*, but refers to them as *abortions*.

⁵ The title for the first five revisions (1900 through 1938) is *Manual of the International List of Causes of Death*; for the sixth (1948) and later revisions, the title is *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*. Each of the revisions includes an historical review of the international classification system, an alphabetical index (in which one can locate abortion-related terms and the codes associated with them), and the codes (and the morbid conditions to which each code applies).

Statistics used the third revision (1920) for the 1922-30 period; the fourth revision (1929) for the 1931-40 period; and the fifth revision (1938) for the 1941-50 period. Each change of *manuals* brought a major change in the way abortion deaths were classified.

Under the third revision (the 1922-30 period), Vital Statistics reports abortion deaths under four categories: *abortion*, *ectopic gestation* (tubal abortion deaths), *puerperal septicaemia* (sepsis following abortion), and *homicide by other means* (criminal abortion deaths).⁶ The first three categories are in the *Pregnancy, Childbirth, and Puerperium* class of causes, but the *homicide by other means* category is in the class of *Violent or Accidental Deaths*.⁷ The *puerperal septicaemia*, *ectopic gestation*, and *homicide by other means* categories do not report subtotals for the abortion deaths they include. Thus the word "abortion" does not appear, except for the *abortion category*, which may explain why the McLarens obtained their statistics solely from this source.

The numbers of *induced* abortion deaths in vital statistics for the 1922-30 period are hard to determine. To begin with, published statistics do not report the number of septic abortion deaths in the totals for the *puerperal septicaemia* category, let alone what proportion of the abortions were induced. Secondly, published statistics do not report the number of *criminal abortion deaths* in totals for the category of *homicide by other means*. Thirdly, published statistics for the *abortion category* are ambiguous about the proportion of these deaths involving induced abortion. Although the sub-categories of "abortion" and "abortion, self-induced" were introduced in 1924, the first sub-category may include induced abortions which were not specified as such on the death registration forms. Lastly, published statistics do not show the number of tubal abortion deaths in the *ectopic gestation* category; however, tubal abortions probably are spontaneous, so their numbers are unimportant here.

To summarize, induced abortion deaths in B.C. vital statistics for the 1922-30 period comprise four different groups: all deaths in the "abortion, self-induced" sub-category of the *abortion category*; all criminal abortion

⁶ *Manual of the International List* (1920), 147.

⁷ For simplicity the writer treats all abortion categories and sub-categories as the *abortion category*. Thus his category includes two *sub-categories* in published sources for the 1922-30 period (143a. *Abortion* and 143b. *Abortion, self-induced*, each in the 143. *Accidents of Pregnancy* category); and two *categories* in published sources for the 1931-40 period (140. *Abortion with Septic Conditions* and 141. *Abortion Without Mention of Septic Conditions*, each of which has two sub-categories, one for *abortion* and one for *abortion, self-induced*).

deaths (numbers unknown) in the *homicide by other means* category; an unknown proportion of the septic abortion deaths (numbers unknown) in the *puerperal septicaemia* category; and an unknown proportion of deaths in the *abortion category* which were not in the sub-category "abortion, self-induced."

The fourth revision (1929) of the International List (used for the 1931-40 period) moved septic abortion deaths from the *puerperal septicaemia* to the *abortion* category, which explains the sharp rise in the McLarens' data between 1930 and 1931.⁸ The fifth (1938) revision (used for the 1941-50 period) moved criminal abortions from the *homicide by other means* to the *abortion* category. This change made little difference to the numbers reported in the *abortion category*, partly because the numbers of reported criminal abortion deaths were small, and partly because improvements in drug therapy (sulphanilamides in the late 1930s, then antibiotics in the 1940s) and blood transfusion techniques were reducing maternal deaths from all causes.

The lack of clear distinction between induced and spontaneous abortions continued throughout the study period. The fourth revision (used for the 1931-40 period) continued the *abortion category* sub-categories of "abortion" and "abortion, self-induced." The fifth revision (used for the 1941-50 period) provided for three sub-categories: "spontaneous, therapeutic, and unspecified"; "self-induced"; and "non-therapeutic" (the criminal abortions).⁹ Here the latter two categories involve induced abortions, but the first category combines three kinds of abortion: induced (therapeutic), unspecified, and spontaneous.

For the period 1950-52, B.C. annual reports of vital statistics do not distinguish at all between spontaneous and induced abortions. The problem here is not the classification system, but rather that the published statistics use the intermediate rather than the detailed list from the *International List* of causes of deaths.¹⁰ Beginning in 1953, published vital statistics use the detailed list from the sixth (1948) revision, which moved "therapeutic" abortions into a separate sub-category. Even shorn of therapeutic abortions,

⁸ The change is mentioned in a source the McLarens cite, J. T. Phair and A. H. Sellars, "A Study of Maternal Deaths in the Province of Ontario," *Canadian Public Health Journal* (December 1934): 565.

⁹ An "induced by another" category appears in the 1948 statistics.

¹⁰ The *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* provides general, intermediate, and detailed lists of causes of death. Like the detailed list, the intermediate list includes categories for *abortion with mention of sepsis* and *abortion without mention of sepsis*, but it omits the sub-categories for *abortion, self-induced*.

however, the first sub-category ("spontaneous or unspecified") remains ambiguous.

To recapitulate, the McLaren data from vital statistics include all deaths in the *abortion category*, but exclude abortion deaths reported in the other categories of *puerperal septicaemia* and *homicide by other means*. Thus the McLarens include spontaneous abortions and miss important numbers of induced abortions, including the criminal cases which most interest them.¹¹

Table 1 shows the difference between the McLaren data (the *abortion category* deaths) and the numbers of abortion deaths reported for all categories (*ectopic gestation* excepted). The Group 1 data report cases for which Vital Statistics do not clearly show whether the abortion was induced or spontaneous. Induced abortion clearly is involved in the columns for Groups 2 and 3, and the last column reports the subtotal for them. For reasons described above, the table 1 data involve estimates for three groups of deaths: criminal abortions in the *homicide by other means* category (1922-40); self-induced abortions and other abortions in the *puerperal septicaemia* category (1922-31); and self-induced abortions in the *abortion category* deaths for the period 1922-24. Details of the estimation procedures are given in Appendix A.

The McLarens should have picked all deaths in the "self-induced" and "illegally induced" categories for their analysis. Less clear, however, is the *proportion* they should have selected from the "spontaneous or unspecified" group. Thus figure 1 below compares the McLaren totals for the study period with four estimates of the totals they would have obtained with a correct selection of cases. The *Est 100* estimate assumes that 100 per cent of the "spontaneous or unspecified" abortions were actually induced abortions; the *Est 00* estimate assumes that *none* of them were; and the *Est 25*, *Est 50*, and *Est 75* estimates are in between, assuming that 25, 50, and 75 per cent respectively of deaths in the group are induced abortions.

¹¹ The McLarens should use the data they do select with greater care. The "*vast majority* [my italics] of the abortion cases . . . brought to the attention of the Attorney-General" involving maternal death (p. 18) turns out to be 74 per cent for the 1920-29 period. In the 1930-39 period "as many as" (?) 36 of 39 cases (92 per cent) involved maternal deaths; this is closer to a "vast majority"; unfortunately, the period for which the totals apply extends two years beyond the 1896-1937 period for which the authors have data (p. 5). Elsewhere (p. 17) the McLarens find that "Vital Statistics was . . . reporting four to five times more abortion deaths than were dealt with by the legal authorities"; however, the statement applies to the period "Between 1931 and 1940," which extends three years beyond their coverage period for Attorney-General's records. If calculations are confined to the coverage period (1931-37), the ratio drops to 2.9 (96 cases in vital statistics and 33 in the legal records).

TABLE 1

*British Columbia Abortion Deaths Reported in Vital Statistics.
The McLaren Data and Actual Totals**

	<i>McLaren Data</i>	<i>Vital Statistics: All Categories</i>	<i>Group 1: Spon- taneous- Unspecified</i>	<i>Group 2: Self- Induced</i>	<i>Group 3: Illegally Induced</i>	<i>Groups 2, 3: Subtotal Induced</i>
1922	13	20.0	15.6	3.8	0.5	4.4
1923	4	10.9	8.8	2.1	0.0	2.1
1924	6	17.5	13.2	3.2	1.1	4.3
1925	2	11.9	9.1	2.2	0.5	2.8
1926	0	10.5	7.6	1.9	1.1	2.9
1927	4	16.5	11.9	2.9	1.6	4.5
1928	0	11.4	9.1	2.2	0.0	2.2
1929	1	13.0	9.5	2.3	1.1	3.4
1930	2	9.9	7.9	1.9	0.0	1.9
1931	12	13.1	11	1	1.1	2.1
1932	10	11.1	8	2	1.1	3.1
1933	8	9.1	6	2	1.1	3.1
1934	14	14.5	12	2	0.5	2.5
1935	17	17.5	12	5	0.5	5.5
1936	21	23.2	15	6	2.2	8.2
1937	14	14.5	7	7	0.5	7.5
1938	19	19.5	11	8	0.5	8.5
1939	16	17.1	12	4	1.1	5.1
1940	8	10.2	6	2	2.2	4.2
1941	6	6	1	3	2	5
1942	11	11	7	4	0	4
1943	11	11	6	4	1	5
1944	9	9	3	5	1	6
1945	10	10	6	1	3	4
1946	1	1	0	1	0	1
1947	3	3	2	1	0	1
1948	6	6	3	1	2	3
1949	4	4	2	2	0	2

* Estimates are involved where fractional values are shown.

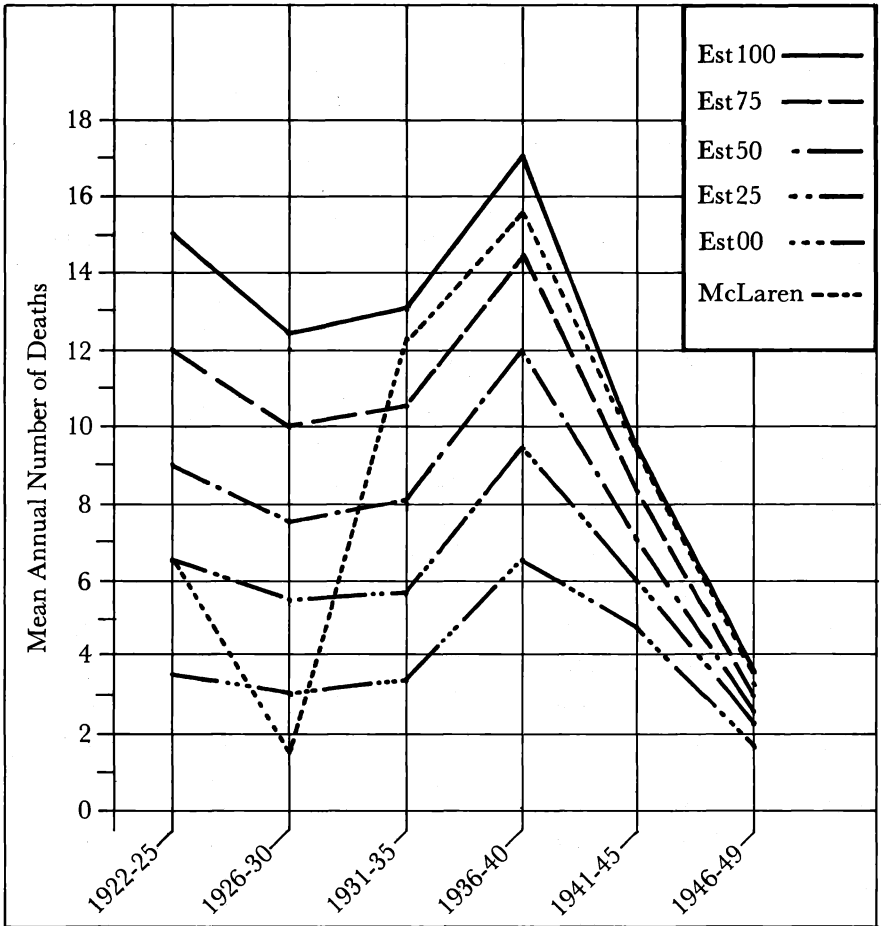


FIGURE 1
 Deaths By Induced Abortion:
 McLaren Data and Different Estimates

Correcting the Published Statistics

Appreciating that legal records and vital statistics underreport abortion deaths, the McLarens correct these flawed data to obtain more accurate totals. To correct the total from legal records (used for the 1920s) they use a multiplier of six; for totals from vital statistics (used for the 1930s and 1940s) the correction factor is "one and one-third." They report 241 abortion deaths from the two documentary sources; with the correction these become 476 cases, or "approximately 30 percent of all maternal deaths" (p. 20).

The corrected figure is invalid, of course, because it is based upon the wrong data from vital statistics. Apparently it also is calculated incorrectly. Their data (table 4 and p. 17) show only 235 deaths (33 from legal records for the 1920s and 202 vital statistics deaths) for the study period, not 241, and when their multipliers are applied, the corrected total is 467, not 476. Bad data and faulty calculation, however, do not invalidate their procedure for correction. Thus this section reviews their procedure for possible application to vital statistics data shown in table 1.¹²

The McLarens are not explicit about their correction procedure, but one can infer it from the information presented. First they compare the *numbers* of abortion deaths reported in two sources for the 1955-59 period: vital statistics and medical reports. They find 14 cases in vital statistics and 19 cases in the medical report data, which leads to the judgement that the vital statistics data are 14/19ths complete. Thus the multiplier to correct the vital statistics total is 1.36 (19/14). Assuming that vital statistics for earlier years underreport abortion deaths by a "similar" proportion, they multiply them by "one and one-third" to obtain corrected totals.

The procedure is reasonable, if alternatives are wanting, but it entails certain assumptions which require discussion and perhaps further investigation. To begin with, the McLarens implicitly assume that the medical survey data are complete. Yet their information source, Dr. W. D. S. Thomas, reporting for the *Maternal Mortality Committee of the British Columbia Medical Association*, mentions only that the data were obtained from hospital records and coroners' reports. Based on British experience

¹² The McLarens use data from legal records rather than vital statistics for the 1920s, apparently because, with their data, legal records report more abortion deaths than vital statistics do for the 1926-30 period (16 to 7). Estimating that only one in ten criminal abortions came to the Attorney-General's attention, they use a multiplier of six to bring the data up to correct levels. However, the multiplier is not explained. Certainly it is not informed by comparison of legal records and medical survey data, since legal records for the 1950s were closed to them. In any case, their decision to use legal records was founded on misinformation, namely their misreading of vital statistics data.

with similar data, one would like assurance here that coroners' reports capture all non-hospital abortion deaths, including deaths which gullible attending physicians might attribute to natural causes, without mention of pregnancy let alone criminal abortion.¹³

Similarly, the McLarens provide only low-grade linkage between the two sources whose abortion deaths are compared. They compare the *numbers* reported in the two sources, but are unable to offer the nominal record linkage which alone can establish whether the two sources report the same abortion deaths. Nominal record linkage, in turn, requires access to death registrations, not just to published vital statistics, and to the original medical survey data, not just to Dr. Thomas' published summary of them. If access to the original data sources is unattainable, the limitations of published summary data must be recognized.¹⁴

Discussion also is warranted for the assumption that vital statistics under-reported abortion deaths by a constant proportion between the 1930s and 1950s. This implies a temporal constancy of social pressures to conceal criminal abortion deaths, and it disregards temporal improvement in the completeness and accuracy of civil registration data.¹⁵

The calculation of the correction factor presents the next problem. To begin with, the McLarens should have found fifteen cases in vital statistics, not fourteen — they miss the induced abortion death reported for 1955. Secondly, of the fourteen cases they found, *five* are reported for the subcategory "spontaneous or unspecified." Thus the measured completeness of the vital statistics data ranges from 10/19ths to 15/19ths, depending on how many of the five cases are treated as *induced abortions not so specified*. Similarly, the correction factor ranges from 1.26 for the maximum measured completeness (15/19th) to 1.9 for the minimum (10/19ths).

Without evidence to the contrary, abortions in the "spontaneous and unspecified" group should be treated consistently over the various time

¹³ C. B. Goodhart, "On the Incidence of Illegal Abortion," *Population Studies* (GrB) 27 (1973): 209-10. For description of the medical survey data, see W. D. S. Thomas, "Abortion Deaths in British Columbia, 1955-1968," *B.C. Medical Journal* 12:5 (May 1970): 111-12.

¹⁴ In recent years, the deputy Registrar-General of Ontario has granted access for scholarly research — at her discretion, on a selective basis, and according to procedures and guidelines established by her Department. Researchers who receive access must take an oath to guard the confidentiality of information reported for individuals. The writer does not know whether the deputy Registrar-General of British Columbia grants access to registrations for scholarly research.

¹⁵ For Canadian experience on this point, see George Emery, "Ontario's Civil Registration of Vital Statistics, 1869-1926: the Evolution of an Administrative System," *Canadian Historical Review* LXIV:4 (December 1983): 468-93.

periods. For example, if two of the five cases for the 1955-59 period are counted as induced abortion deaths, then two-fifths (40 per cent) of the cases for the 1922-49 period also must be counted as induced abortion deaths. Thus, as shown in table 2, the larger the correction multiplier, the smaller the number of cases to which the correction is applied and the smaller the estimate resulting. Figure 2 shows how the different completeness estimates (10/19ths through 15/19ths) affect the corrected totals for the entire 1922-49 study period.

TABLE 2
*Estimates of Deaths from Induced Abortions, 1931-40,
Using Different Correction Multipliers*

<i>Multiplier</i>	<i>Annual Mean N. Induced Abortions</i>	<i>Annual Mean N. Spontaneous-Unspecified Cases Counted As Induced</i>	<i>Total Cases</i>	<i>Total Corrected Cases</i>
19/15 (1.26)	5	10	15	19
19/14 (1.36)	5	8	13	17.6
19/13 (1.46)	5	6	11	16
19/12 (1.58)	5	4	9	14.3
19/11 (1.73)	5	2	7	12.1
19/10 (1.90)	5	0	5	9.5

Abortion Deaths and the Maternal Mortality Rate

Using their own corrected figures, the McLarens show (induced) abortion deaths to have been responsible for "approximately 30 percent of all maternal deaths" for the 1922-49 period. This proportion, they argue, "would appear to be about right since Dr. W. D. S. Thomas found that in the 1950s abortion deaths were responsible for 27.5 percent of all maternal deaths" (p. 20).

The McLarens implicitly assume here that deaths from induced abortion are close to a constant proportion of maternal deaths between the 1920s and 1950s, a period when the maternal mortality rate fell sharply. The implication is that induced abortion deaths fell in proportion with other pregnancy-related deaths. The authors present no theory for such an as-

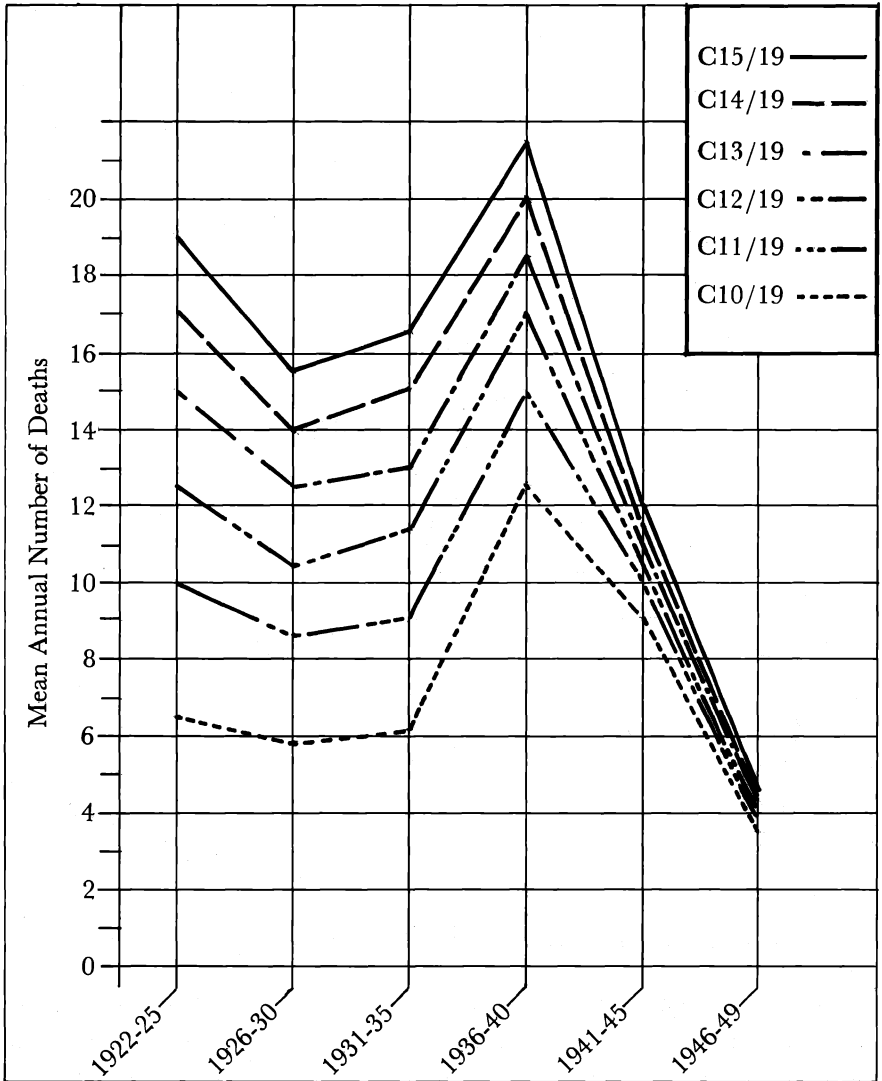


FIGURE 2
 Induced Abortion Deaths in B.C.
 Estimates Using Different Multipliers

sumption, and it fits poorly with other statements they make and trends calculated from their data.¹⁶

Secondly, the McLarens correct their total for abortion deaths (from 241 to 476), but do not mention adding any of the 235 new cases to the total for maternal deaths.¹⁷ This assumes implicitly that all 235 deaths added through correction (476-241) had been: i. registered with Vital Statistics, and ii. classified under "Diseases of Pregnancy, Childbirth, and Puerperal State." The assumption is tenuous. A multitude of incorrect, incomplete, or ambiguous reported causes of death serve to conceal a criminal abortion, and several of them (e.g., *hemorrhage*, *septicaemia*, *myocardial failure*) do not lead to classification in the *Puerperal State class*.¹⁸

A further problem is that calculation of the maternal mortality rate is fraught with methodological difficulties. To begin with, the conventional measure of the rate — the number of maternal deaths per 1,000 live births — poorly measures the risk of death from pregnancy. Whereas the denominator allows only one pregnancy outcome (live birth), the numerator allows four (live birth, stillbirth, abortion, and maternal death with no delivery). Secondly, Canadian civil registration systems collect statistics for only two pregnancy outcomes (live birth and stillbirth) and under-report both of them. Thirdly, published vital statistics for the *Puerperal State class* of deaths — conventionally used to calculate maternal death

¹⁶ Various statements, some conflicting with each other, clash with the constant proportion assumption: i. "It is difficult to determine which decade had the highest level of abortion deaths" (p. 17); ii. "Abortion deaths almost every year contributed to the level of maternal mortality, but the proportion which they contributed varies substantially over time" (p. 9); iii. "Abortion deaths were . . . not simply increasing relative to the rate of maternal deaths. In the 1930s and 1940s they increased in absolute numbers" (p. 14).

¹⁷ It is hard to tell what the McLarens have done here. They report that abortion deaths accounted for "approximately 30 percent of all maternal deaths." Yet 476 abortion deaths are 33 per cent of the 1,426 maternal deaths for the 1922-49 period. Perhaps the 30 per cent figure, like the 476 figure, results from calculation error.

¹⁸ In his analysis of Ontario death registrations for 1920 and 1930, the writer found many cases which may have been pregnancy-related but could not be identified as such from information on the death registration (for example, a reported cause of *septicaemia*, without indication of whether the *septicaemia* was puerperal in origin). For certain of these cases, the writer located an infant's birth, stillbirth, or death registration which named the woman as the infant's mother and reported a birth date on or shortly before the day of death. For 1930, 18 such cases were identified as pregnancy-related from supplementary information which the Registrar-General obtained through correspondence and noted on the registration form, in red ink (a practice not begun until 1925).

To summarize, ambiguous or incomplete information in death registrations caused certain pregnancy-related deaths to be reported for non-obstetric *classes* of deaths in published statistics. In the circumstances, published totals for the *Puerperal State class* are unlikely to include all *concealed or otherwise misreported criminal abortion deaths*.

totals — do not include all pregnancy-related deaths; in particular, they exclude *criminal abortion deaths* and *indirect maternal deaths* (i.e., attributed to non-maternal causes which would not have proven fatal but for the additional stress imposed by pregnancy). Lastly, induced abortions present a special problem: each *induced abortion death* adds one to the numerator but not to the denominator; at the same time, each *induced abortion, fatal or not*, is likely to subtract one from the denominator by eliminating a prospective live birth.¹⁹

Ignoring the difficulties described above, table 3 presents the six estimates of induced abortion deaths as proportions of maternal deaths for the entire study period. Figure 3 presents the same information for different time periods between 1922 and 1949.

TABLE 3
*Estimates of Deaths from Induced Abortion as a
Proportion of All Maternal Deaths for the Period 1922-49²⁰*

	C10/19	C11/19	C12/19	C13/19	C14/19	C15/19
<i>Induced Abortions</i>	109	109	109	109	109	109
<i>Other Abortions</i>	223	223	223	223	223	223
<i>Proportion Other in Base Number</i>	0.00	0.20	0.40	0.60	0.80	1.00
<i>N. of Other Deaths in Base Number</i>	0	45	89	133	178	223
<i>Base Number</i>	109	154	198	243	287	332
<i>Correction Factor</i>	1.90	1.73	1.58	1.46	1.36	1.26
<i>Corrected Total</i>	208	266	314	355	390	421
<i>Maternal Deaths</i>	1,426	1,426	1,426	1,426	1,426	1,426
<i>% Maternal Deaths</i>	15	19	23	25	27	30

¹⁹ L. H. Roht, *et al.*, "The Impact of Legal Abortion — Redefining the Maternal Mortality Rate," *Health Services Report* 89 (1974): 267-73.

²⁰ The total for *induced* abortion deaths is calculated from the *Groups 2, 3: Subtotal Induced* column in table 1. The total for *other* abortion deaths is calculated from the *Group 1: Spontaneous and Unspecified* column data in table 1. The base number comprises the *induced abortion deaths* plus a proportion of the *other abortion deaths*. The proportion included in the *base number* varies according to the correction factor used, as explained for table 2. The *corrected total* results from the application of the *correction factor* to the *base number*. As in the McLaren study, the maternal death total is calculated from published statistics for the *Puerperal State class* of deaths.

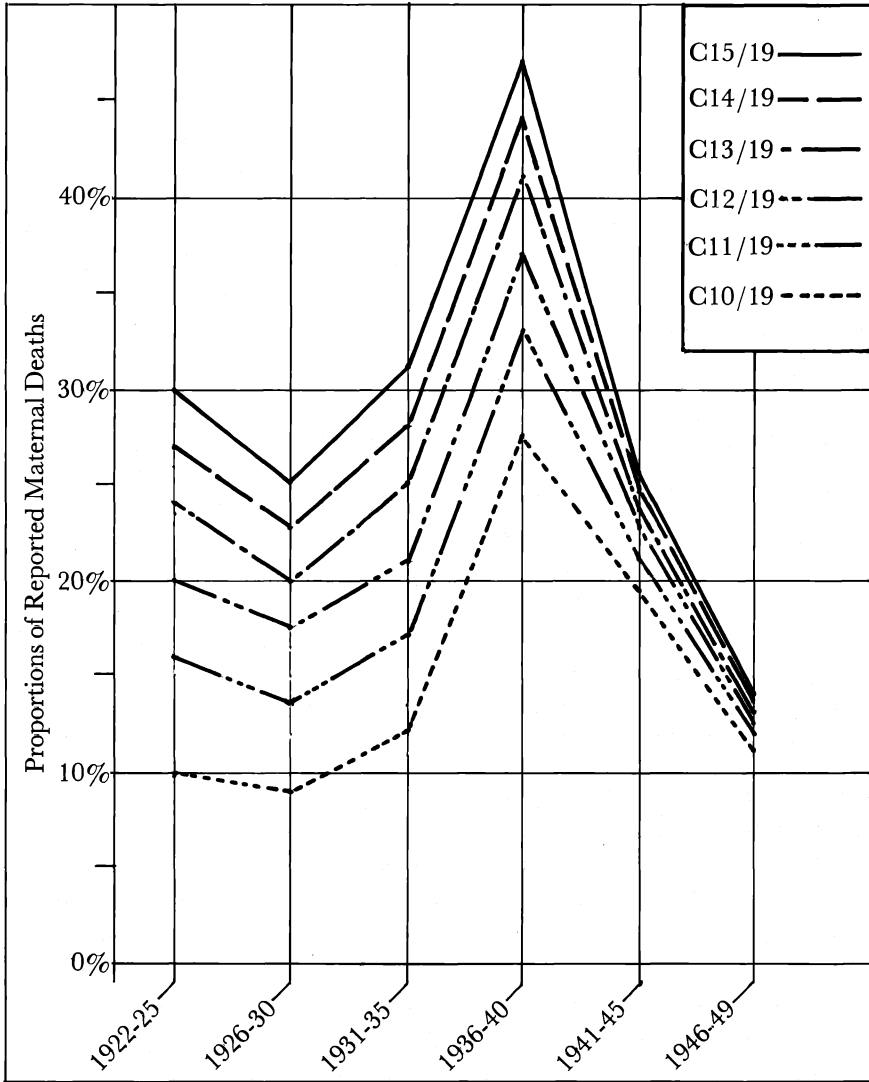


FIGURE 3
Induced Abortion Deaths As
Proportions of Maternal Deaths

All things considered, induced abortions probably furnished considerably less than 30 per cent of maternal deaths, the figure the McLarens report. Only the maximum estimate attains that magnitude, and it entails the dubious assumption that 100 per cent of the "spontaneous or unspecified" abortions (including the five reported for the 1955-59 period) were *misreported induced abortions*. Secondly, an undercount of maternal deaths inflates each estimate. Specifically, none of the abortion deaths added through data correction are included in the maternal death totals, and published statistics for the *Puerperal State class* are certain to have underreported maternal deaths, especially for early years of the study period.

From Criminal Abortion Deaths to Criminal Abortions

From the finding that "abortion deaths did significantly contribute to maternal mortality," the McLarens infer

that abortion was a method of fertility control far more widely employed in past decades than is often realized. The ratio of abortion deaths to the total number of abortions presumably varied from year to year and is impossible to determine. But whether the ratio was 1:100 or 1:1000 it still means that enormous numbers of women were seeking by risky and illegal methods to terminate their pregnancies.

Here the McLarens infer a widespread occurrence of criminal abortions from a ratio of abortion deaths to abortions which "is impossible to determine." Secondly, the McLarens might have consulted the literature on the frequency of illegal abortions to improve their guesswork. Thirdly, as elaborated below, both the ratios suggested (1:100, 1:1,000) seem too high.

As shown in table 4, data projections from a 1:1,000 ratio are in the realm of the fantastic. As the ratio also is the *abortion mortality rate*, it means that criminal abortion was over three times safer than other pregnancy outcomes for the 1931-40 period. Using the McLarens' corrected data, the ratio also means that British Columbia had 1.6 criminal abortions for each of its registered live births.

Data projectitons from the 1:100 ratio are more credible, but even these may be high. A study based on data for England and Wales, for example, estimates a maximum of 15,000 criminal abortions annually during the early 1960s, just before Britain's passage of liberalized abortion legislation. This number is equal to 1.7 per cent of the live births for Eng-

TABLE 4

*British Columbia, 1931-40: Mean Annual Number of Abortion Deaths and the Abortion Mortality Rate**

<i>Data</i>	<i>Annual Mean N. Abortion Deaths</i>	<i>Number of Abortions</i>	<i>Abortion Deaths Per 1,000</i>	<i>Maternal Mortality Rate Excluding Abortions</i>	<i>Abortions Per Live Birth</i>
<i>1: 1,000 Ratio</i>					
McLaren VS	13.9	13,900	1.0	3.1	1.2
McLaren Cor.	18.5	18,500	1.0	3.1	1.6
Actual Min.	5	5,000	1.0	3.1	0.4
Actual Max.	15	15,000	1.0	3.1	1.3
Corrected Min.	9.5	9,500	1.0	3.1	0.8
Corrected Max.	19	19,000	1.0	3.1	1.7
<i>1: 100 Ratio</i>					
McLaren VS	13.9	1,390	10.0	3.1	0.12
McLaren Rev.	18.5	1,850	10.0	3.1	0.16
Actual Min.	5	500	10.0	3.9	0.04
Actual Max.	15	1,500	10.0	3.0	0.13
Corrected Min.	9.5	950	10.0	3.0	0.08
Corrected Max.	19	1,900	10.0	3.0	0.17

* Live Births = 11,519; Data = *McLaren Data*, published statistics and corrected totals; *actual published totals*, minimum and maximum figures for induced abortions; and *corrected actual totals*, minimum and maximum corrections.

land and Wales.²¹ Applied to British Columbia's reported live births for the study period, the same ratio of criminal abortions to live births yields an estimate of 199 criminal abortions, less than half of the lowest estimate presented in table 4. Thus if British Columbian experience for the 1922-49 period is similar to that estimated for England and Wales for the 1960s,

²¹ C. B. Goodhart, "On the Incidence of Illegal Abortion," *Population Studies* (GrB) 27 (1973): 207-34. See also Thomas S. Hilgers, "Abortion Related Maternal Mortality," in *New Perspectives on Human Abortion*, ed. Thomas S. Hilgers, et al. (1981): 69-91; W. Cates, et al., "The Effect of Liberalized Abortion on Maternal Mortality Rates," *American Journal of Obstetrics and Gynecology* 130 (1978): 372-75; reply by Dennis Cavanagh, 375-76.

TABLE 5

*Estimates of the Criminal Abortion Mortality Rate
and the Ratio of Criminal Abortions to Criminal Abortion Deaths*

<i>Data</i>	<i>Annual Mean N. Abortion Deaths</i>	<i>Number of Abortions</i>	<i>Deaths Per 1,000 Criminal Abortions</i>	<i>Maternal Mortality Rate Excluding Abortions</i>	<i>Abortion Per Abortion Death</i>
Reported Min.	5	199	25	3.9	39.8:1
Reported Max.	15	199	76	3.0	13.3:1
Min. Estimate	9.5	199	47.7	3.5	21.0:1
Max. Estimate	19	199	95.5	2.7	10.5:1

induced abortions were less popular in the province than the McLarens suggest.²² As shown in table 5 for the 1931-40 period, they also were much deadlier.

Conclusion

Not all *abortions* are *induced abortions*, and not all *abortion deaths* in British Columbia's vital statistics are reported in the *abortion category*. By missing these features of the evidence, the McLarens base their analysis on the wrong abortion deaths, incorrectly adjust the published statistics to compensate for their incompleteness, and exaggerate the proportion of maternal deaths coming from criminal abortions. Probably they also exaggerate the number of criminal abortions in British Columbia society during the study period; as an instrument of birth control, illegal abortion quite possibly was *less traditional* than they suggest and *much riskier* than they realize.

Although critical of the McLarens' research procedures and findings, this critique builds on their work to elaborate the methodological issues and obtain more accurate data. In the process, it resolves old issues, but raises new ones, such as how one should interpret abortion deaths which are categorized as "spontaneous or unspecified." To advance knowledge on some of the issues requires new research and different source materials than those considered here. In this respect, the death registrations collected in

²² Whether the two populations had similar rates of criminal abortion is unknown. In the absence of a better comparison population, however, the English-Welsh experience is suggestive for British Columbia.

British Columbia's civil registration system — the basis for the published statistics — are particularly promising.²³

Simply put, British Columbia's criminal abortion and maternal mortality history needs work. Whoever does the work will, like this writer, respond to the issues posed in the McLarens' flawed but important article.

²³ For the 1920-35 period, the death registrations report medically certified information on *primary* and *contributory* causes of death; whether an operation preceded death; and whether an autopsy was held.

An example from the writer's examination of Ontario death registrations for 1930 illustrates the potential and limitations of registration data. Using published statistics for *homicide by other means* category, one may estimate 3.7 criminal abortion deaths for the year. The death registrations, on the other hand, report five deaths from criminal abortion, one of which published sources appear to report (incorrectly) in the category of *puerperal septicaemia*. They also report that an autopsy was held for five other abortion-related deaths — possibly an indication that criminal abortion was suspected.

In addition, the registrations report six deaths involving self-induced abortion and three deaths involving therapeutic abortion. For nine other abortion-related deaths, they give circumstantial evidence (e.g., advanced fetal gestational age) of spontaneous abortion. For fifty of the sixty-four abortion-related deaths reported for 1930, however, the only certainty is that the abortion is not specified as induced.

APPENDIX A

Details of the Estimation Procedures Used in Table 1

I. *The Estimate of Criminal Abortions.* Deaths in the *Homicide by Other Means* category involve both sexes and all age groups, but published subtotals show the number involving females in the age group 15-49 (the *target group*). To estimate the number of criminal abortion deaths, totals for the target group are calculated for the five-year periods immediately preceding and following the removal of criminal abortions from the *homicide by other means* category in 1941. As table 6 shows, the target group total falls by approximately the total reported for the new *abortion category* sub-category "induced for non-therapeutic reasons." Had no change in classification occurred, 7/13ths (53.8 per cent) of the target group deaths for the 1941-45 period would have involved criminal abortion. Thus the estimate of criminal abortion deaths for the 1922-40 period is 53.8 per cent of the target group deaths reported for those years.

As shown in table 6, the estimation procedure fails with Ontario data: the target group total falls between the two time periods, but not commensurately with total for the "induced for non-therapeutic reasons" sub-category.

TABLE 6
*Deaths of Females Aged 15-49 in Categories
Involving Criminal Abortions*

<i>Period</i>	<i>Homicide by Other Means Target Group</i>	<i>Abortions Induced for Non-Therapeutic Reasons</i>	<i>Two-Category Total</i>
<i>British Columbia</i>			
1936-40	12	no-sub-category	12
1941-45	6	7	13
<i>Ontario</i>			
1936-40	42	no sub-category	42
1941-45	38	26	64

However, a second procedure yields identical estimates for British Columbia. The first step is to use known values for the period 1941-49 to calculate *criminal abortion deaths* (the "induced for non-therapeutic reasons" sub-category) as a proportion of *criminal abortion deaths plus target*

group deaths. The second step is to assume that *criminal abortion deaths* were the same proportion of *target group deaths* for earlier years. In table 7, the (step one) proportion for the five-year period (0.54) is used for the estimates reported in table 1. Thus the 2.15 criminal abortions estimated for 1940 represents 54 per cent of the four target group deaths reported for the year. To provide context for the choice of the five-year statistic, table 7 reports the proportions for four- to nine-year periods, and for Ontario as well as British Columbia.

TABLE 7

Criminal Abortion Deaths as a Proportion of Criminal Abortion Deaths Plus Target Group Deaths in the Homicide by Other Means Category

<i>Period</i>	<i>British Columbia Proportion</i>	<i>B.C. N.</i>	<i>Ontario Proportion</i>	<i>Ont. N.</i>
1941-44	0.50	8	0.42	55
1941-45	0.54*	13	0.41	64
1941-46	0.50	14	0.38	78
1941-47	0.47	15	0.38	97
1941-48	0.43	21	0.35	113
1941-49	0.41	22	0.36	124

* Multiplier used for the estimates.

II. *The Estimate of Septic Abortions*. Rates of puerperal infection did not drop until the late 1930s, when new drug therapies (sulphanilamides, and later antibiotics) became available. Thus change in the classification system (the removal of postabortive sepsis deaths from the *puerperal septicaemia* category in 1931) explains why the *mean number of deaths* reported for the category declined from 20.4 to 8.8 between the 1926-30 and 1931-35 periods.

The estimation procedure used is similar to the second procedure described above for the estimates of criminal abortion deaths. The first step is to use known values for the 1931-35 period to calculate *septic abortion deaths* as a proportion of *septic abortion deaths plus puerperal septicaemia category deaths*. The second step is to assume that septic abortions are the same proportion of *puerperal septicaemia category deaths* for earlier years. As shown in table 8, the statistic for the five-year period is used for the

TABLE 8

*Septic Abortion Deaths as a Proportion of Puerperal Septicaemia
Category Deaths Plus Septic Abortion Deaths*

<i>Period</i>	<i>British Columbia Proportion</i>	<i>B.C. N.</i>	<i>Ontario Proportion</i>	<i>Ont. N.</i>
1931-34	0.45	38	0.38	283
1931-35	0.49*	44	0.40	332
1931-36	0.55	51	0.37	417
1931-37	0.56	60	0.37	482
1931-38	0.58	67	0.37	532
1931-39	0.60	70	0.38	582

* Multiplier used for the estimates.

estimates reported in table 1. Thus the 8.9 septic abortion deaths estimated for 1930 represents 49 per cent of the 18 *puerperal septicaemia deaths* reported for the year.

III. *Estimate of Self-Induced Abortions in the Septic Abortion Totals (as estimated)*. Of the *septic abortion deaths* reported for the 1931-35 period, 19.6 per cent are reported in the sub-category of *abortion, self-induced*; the estimate for earlier years assumes that the same proportion are self-induced septic abortions.

IV. *Self-Induced Abortions in the Abortion Category for the Period 1922-24*. Eighteen per cent of these deaths are reported in the *abortion, self-induced* sub-category for the period 1925-30. The same proportion is assumed for the 1922-24 period.