Enid Charles
1894-1972

A socialist, feminist demographer and her analysis of the timing of birth

Alison Macfarlane

City, University of London

Plan of talk

Enid Charles' life and contributions to demography

Based on the work of Canadian demographer, Sylvia Wargon

Analysis of birth and its timing

As described in her own papers.

Education and marriage

1894 Born in Denbigh, Wales

1913 -1916 Studied mathematics, economics and statistics at Newnham College, Cambridge

1916 Went to Liverpool for a one year diploma course in social science

1917 Returned after 10 months to live with Lancelot Hogben.

1918 Despite opposition to marriage, married Hogben as expecting their first child, Sylvia. Kept her own name.

1918 - 1930

Followed Hogben from job to job

Had three more children, Adrian, Clare and David.

1925-27 Canada , McGill, Montreal

1927-30 South Africa, University of Cape Town

PhD in physiology followed by papers

Left South Africa with threat of apartheid growing

LSE, 1930-37

Research fellow in Department of Social Biology where her husband was Professor of Social Biology.

Social biology defined as

' the application of biology to human society, to cover such topics as variation and heredity in man, selective immunity, relative importance of environmental factors in social structure and changes, questions of race and class in relation to hereditary endowment, economic and biological tests of fitness... Through vital statistics, social biology would connect with public health'

LSE, 1930-37

Enid Charles' Interest switched to human populations

Among the first demographers to challenge eugenics

Became associated with the work of the Population Investigation Committee, founded in 1935

'to examine the trends of the population in Great Britain and the Colonies and to investigate the causes of these trends, with special reference to the fall of the birth-rate.'

Initially founded by the Eugenics Society but moved away from it.

LSE 1930-37

Charted declining birth and marriage rates in the 1930s

Derived population projections for the future based on data up to the 1930s.

‘The practice of birth control: an analysis of the birth control experiences of 900 women.’ 1932

‘The twilight of parenthood: A biological study of the decline of population growth.’ 1934

Republished as

‘The menace of under-population: a biological study of the decline of population growth.’ 1936

Trends in reproduction

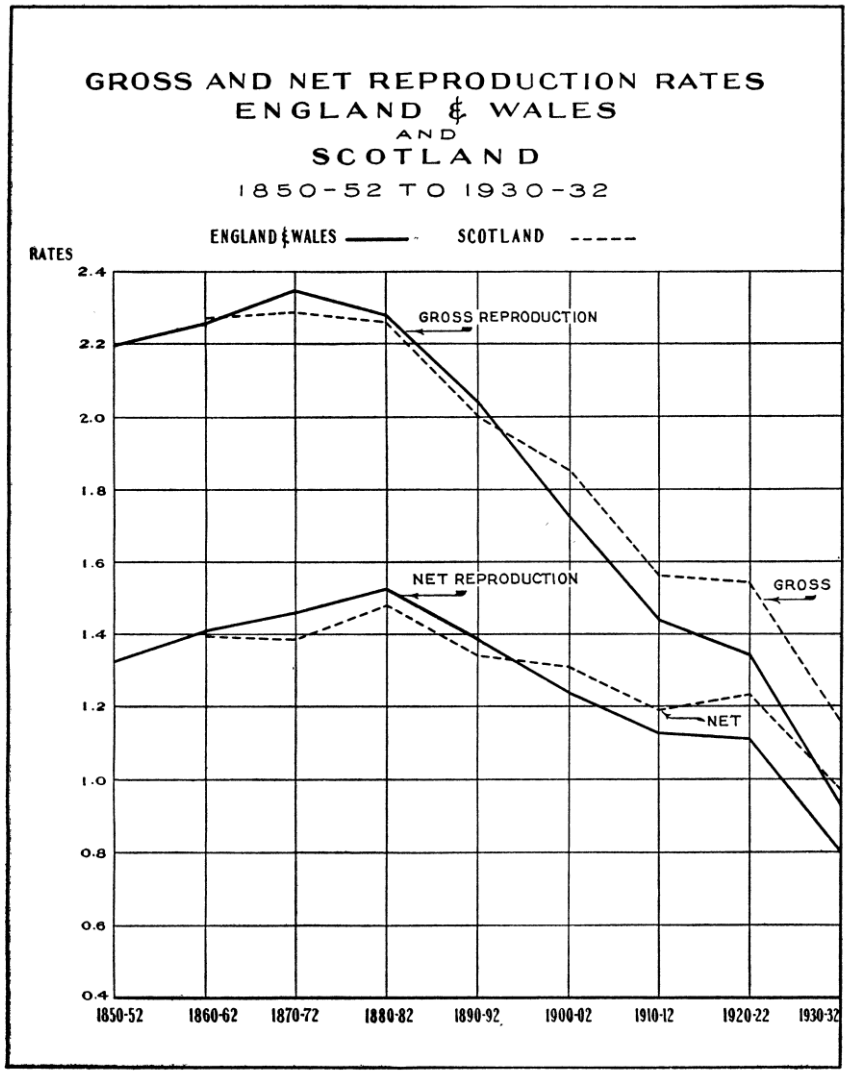


FIGURE 1

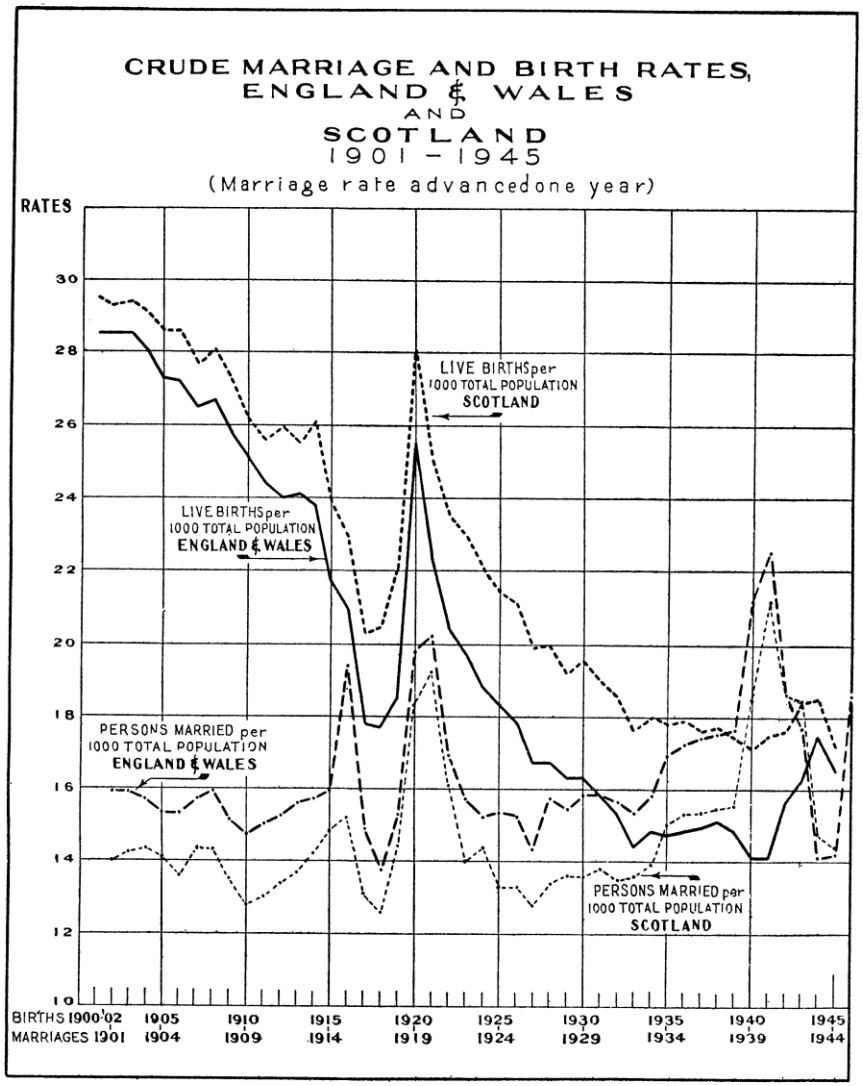


FIGURE 2

Charles E. 'Post-War Demographic Problems in Britain', 1946

Population projections, 1934

‘ … the population of England and Wales which was 40.6 million in 1935, would fall to 17.4 million in 2000 and to 4.4 million in 2035, if age-specific mortality and fertility rates were to continue to fall at the rate at which Swedish age-specific fertility rates had fallen between 1921 and 1931.’

Eugene Grebenik, ‘Demographic Research in Britain, 1938-1986’, 1991

From a review of
‘The twilight of parenthood’

‘Miss Charles writes with vigor and cogency, and has at hand whenever she wants to use it a caustic humor that affords many a pungent sentence’

New York Times, August 26 1934

Aberdeen 1937-40

Leverhulme Research Fellow, Department of Natural History.

Contributed to *'Political Arithmetic',* 1938, edited by Lancelot Hogben.

Accepted invitation to go to Canada in 1940 to do a study of differential birth rates in Canada.

Hogben invited to spend a semester as visiting professor, University of Wisconsin. Returned 1941

Canada 1940-46

Stayed until 1946, working for Dominion Bureau of Statistics, now Statistics Canada.

Instrumental in developing demography in Canada.

Analysed data from new questions on nuptiality, fertility and internal migration in 1941 decennial census.

Contributed to evaluation of Canadian census and vital statistics.

Lectured at Carleton College, later Carleton University.

Birmingham 1946-53

Joined Hogben who had moved to Birmingham, 1946

No job lined up.

Birmingham City Council Statistical Office, 1947

Reader in Demography and Vital Statistics, University of Birmingham, 1948

Chief Statistical Officer, two Birmingham hospitals, 1949

Joined RSS in 1947

Developing Birmingham's Maternity and Child Welfare records

Brit. J. soc. Med. (1951), **5**, 41-61

STATISTICAL UTILIZATION OF MATERNITY AND CHILD WELFARE RECORDS

BY

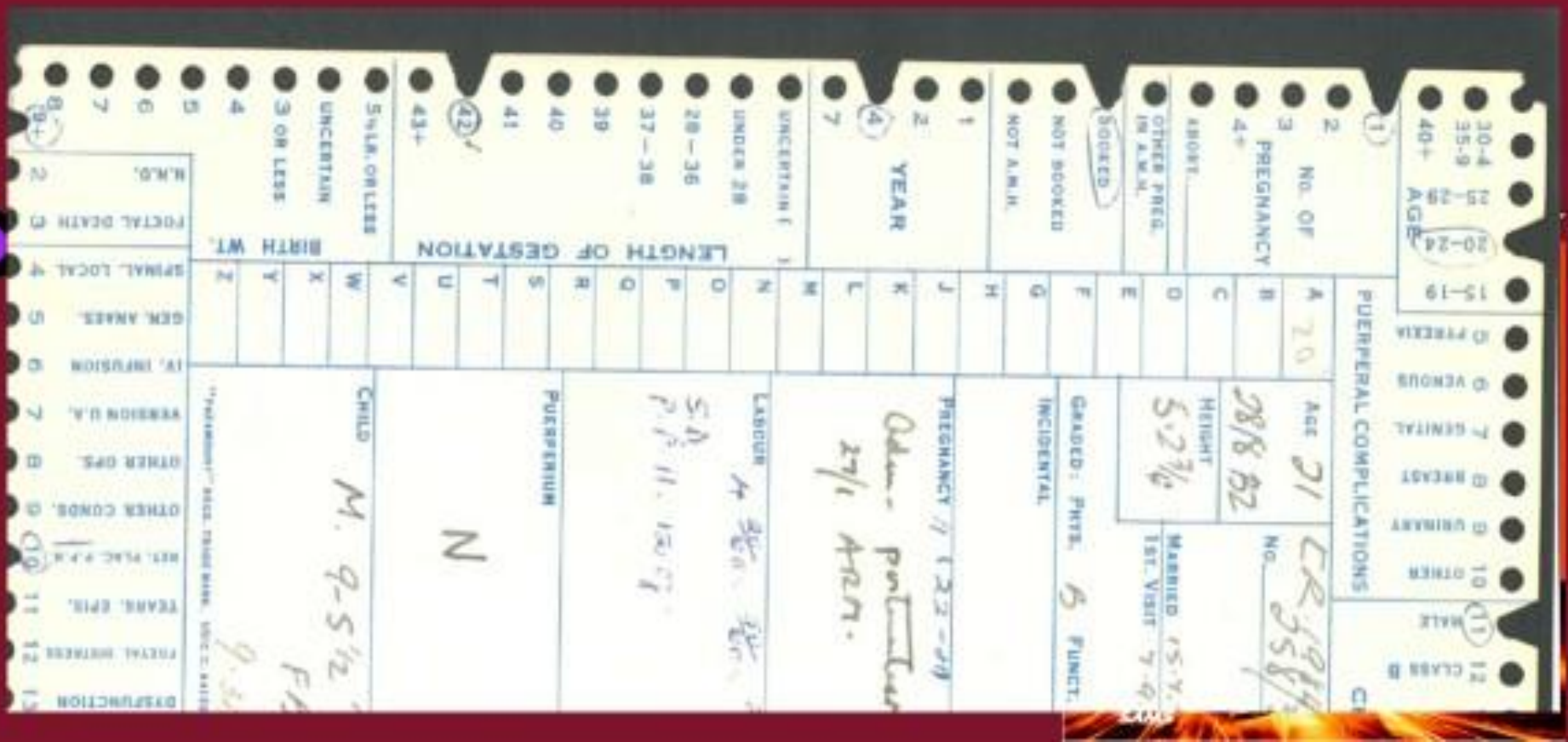
ENID CHARLES

From the Central Statistical Office, City of Birmingham, and the Department of Social Medicine, University of Birmingham

Aberdeen Maternity and Neonatal Databank

Started by Prof. Sir Dugald Baird in 1950 in collaboration with the MRC Medical Sociology Unit

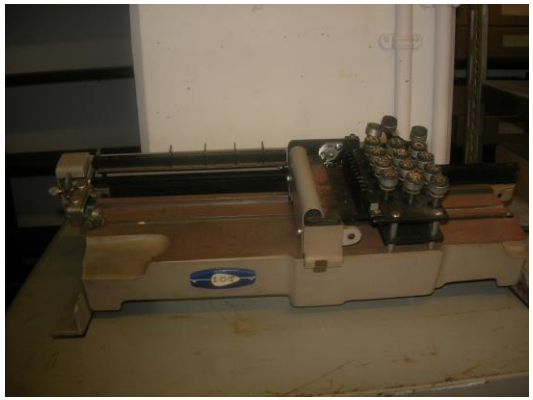
- From punched cards and knitting needles to tapes……to SiR ……to SQL



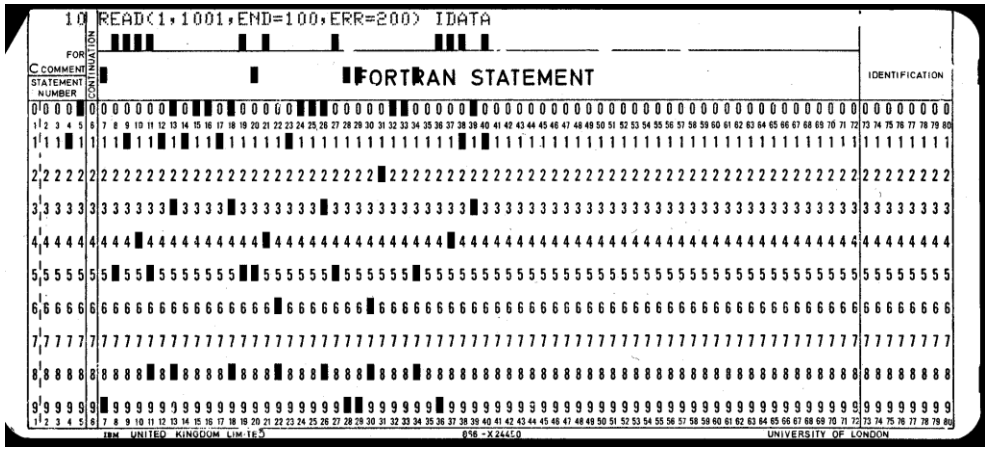
Data entry and processing in the 1950s

Punched cards, punched tape and Cope Chat cards with needle

Basic card punch



Close up of 80 column punched card, as adapted for entering Fortran code in the 1970s



Developing a mechanised system of health visiting records

Aim

Redesigning health visiting records to bring together information about

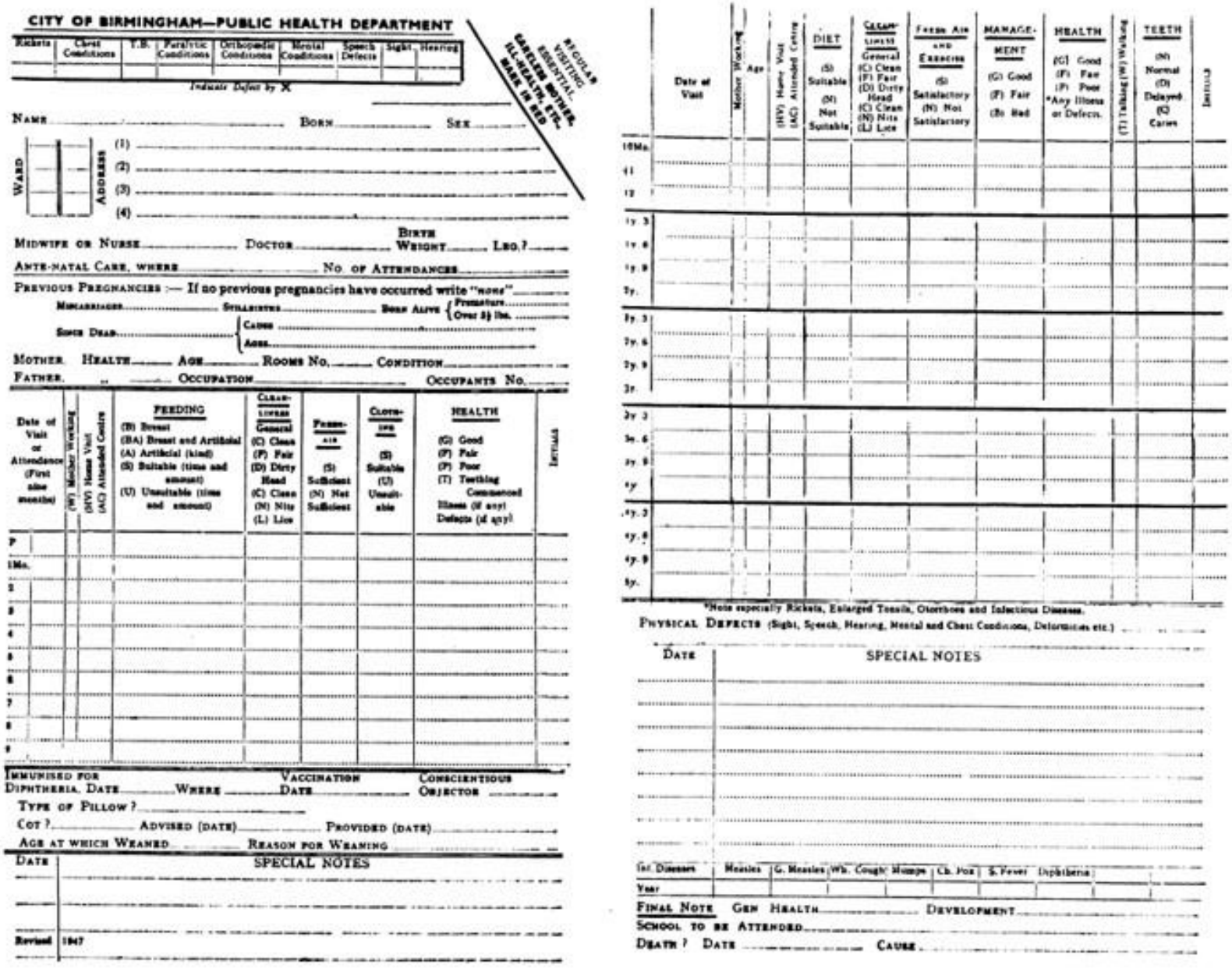
The family and its circumstances

Antenatal care

Details of birth

Information recorded by health visitors in the first five years of the child's life.

Birmingham health visiting record, 1948



CITY OF BIRMINGHAM—PUBLIC HEALTH DEPARTMENT

Rickets | Chest Conditions | T.B. | Paralytic Conditions | Orthopædic Conditions | Mental Conditions | Speech Defects | Sight | Hearing

Indicate Defect by X

REGULAR VISITING ESSENTIAL. CARELESS MOTHER, ILL-HEALTH, ETC. MARK IN RED

NAME ..... BORN ..... SEX .....

WARD ..... ADDRESS (1) (2) (3) (4)

MIDWIFE OR NURSE ..... DOCTOR ..... BIRTH WEIGHT ..... LBS.? .....

ANTE-NATAL CARE, WHERE ..... NO. OF ATTENDANCES .....

PREVIOUS PREGNANCIES :— If no previous pregnancies have occurred write "none"

MISCARRIAGES ..... STILLBIRTHS ..... BORN ALIVE { Premature ..... Over 5½ lbs. .....

SINCE DEAD ..... { CAUSE ..... AGES .....

MOTHER. HEALTH ..... AGE ..... ROOMS NO. ..... CONDITION .....

FATHER. .. .. OCCUPATION ..... OCCUPANTS NO. .....

Date of Visit or Attendance (First nine months)	Mother Working (W)	Home Visit (HV) Attended Centre (AC)	FEEDING (B) Breast (BA) Breast and Artificial (A) Artificial (kind) (S) Suitable (time and amount) (U) Unsuitable (time and amount)	CLEANLINESS General (C) Clean (F) Fair (D) Dirty Head (C) Clean (N) Nits (L) Lice	FRESH AIR Sufficient (S) Not Sufficient (N)	CLOTHING (S) Suitable (U) Unsuitable	HEALTH (G) Good (F) Fair (P) Poor (T) Teething Commenced Illness (if any) Defects (if any)	INITIALS
b								
1Mo.								
2								
3								
4								
5								
6								
7								
8								
9								

IMMUNISED FOR DIPHTHERIA. DATE ..... WHERE ..... VACCINATION DATE ..... CONSCIENTIOUS OBJECTOR .....

TYPE OF PILLOW ? .....

COT ? ..... ADVISED (DATE) ..... PROVIDED (DATE) .....

AGE AT WHICH WEANED ..... REASON FOR WEANING .....

DATE	SPECIAL NOTES
Revised 1947	

Date of Visit	Mother Working (W)	Age	Home Visit (HV) Attended Centre (AC)	DIET (S) Suitable (N) Not Suitable	CLEANLINESS General (C) Clean (F) Fair (D) Dirty Head (C) Clean (N) Nits (L) Lice	FRESH AIR AND EXERCISE (S) Satisfactory (N) Not Satisfactory	MANAGEMENT (G) Good (F) Fair (B) Bad	HEALTH (G) Good (F) Fair (P) Poor *Any Illness or Defects.	(T) Talking (W) Walking	TEETH (N) Normal (D) Delayed (C) Caries	Initials
10Mo.											
11											
12											
1y. 3											
1y. 6											
1y. 9											
2y.											
2y. 3											
2y. 6											
2y. 9											
3y.											
3y. 3											
3y. 6											
3y. 9											
4y											
4y. 3											
4y. 6											
4y. 9											
5y.											

*Note especially Rickets, Enlarged Tonsils, Otorrhœa and Infectious Diseases.

PHYSICAL DEFECTS (Sight, Speech, Hearing, Mental and Chest Conditions, Deformities etc.) .....

DATE	SPECIAL NOTES

Inf. Diseases	Measles	G. Measles	Wh. Cough	Mumps	Ch. Pox	S. Fever	Diphtheria
Year							

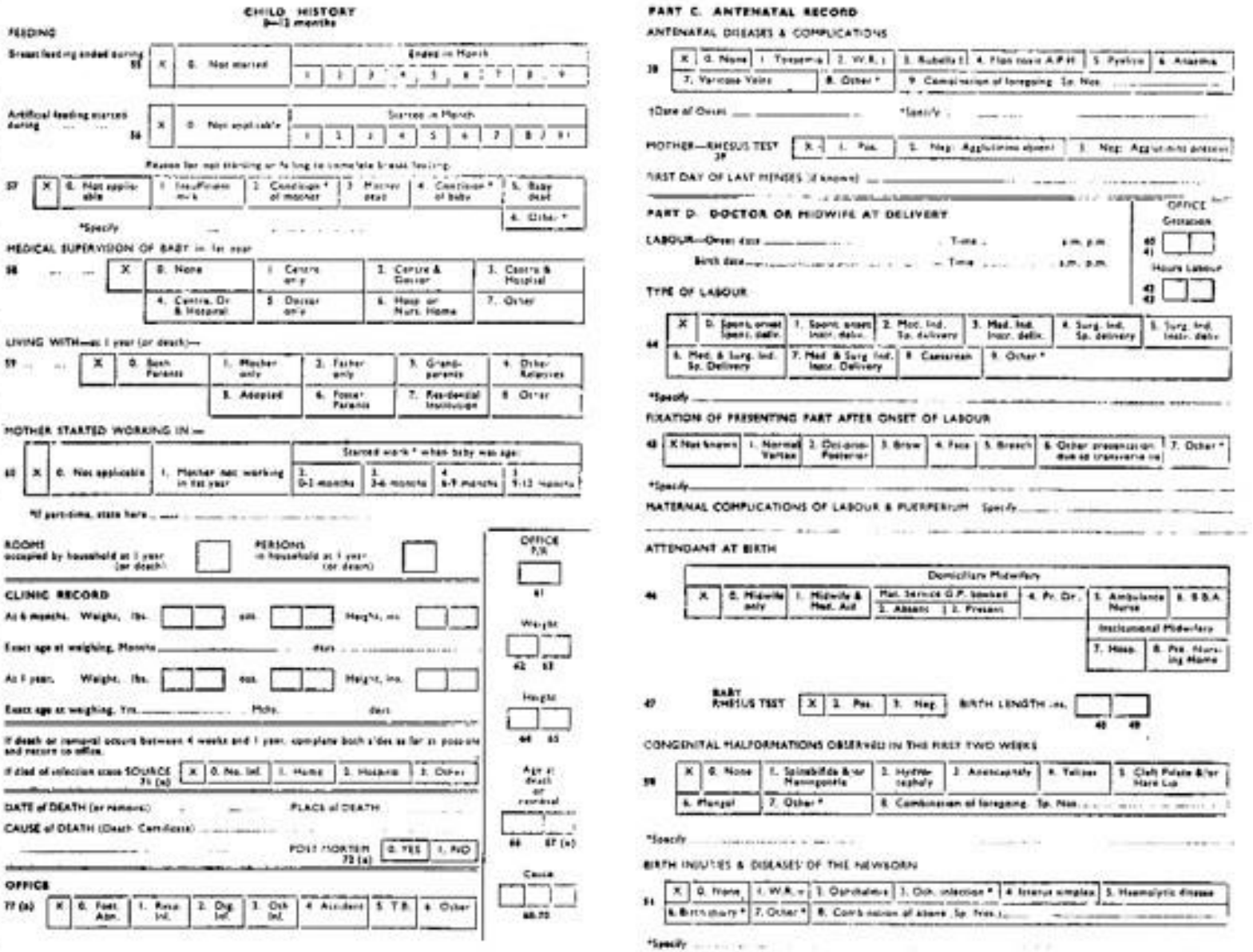
FINAL NOTE GEN. HEALTH ..... DEVELOPMENT .....

SCHOOL TO BE ATTENDED .....

DEATH ? DATE ..... CAUSE .....

FIG. 3.—Health Visitor's Record, 1948. Maternity and Child Welfare Department, City of Birmingham.

Page 1 of redesigned record, 1950



CHILD HISTORY

FEEDING

PART C. ANTENATAL RECORD

ANTENATAL DISEASES & COMPLICATIONS

PART D. DOCTOR OR MIDWIFE AT DELIVERY

MEDICAL SUPERVISION OF BABY

LIVING WITH

MOTHER STARTED WORKING IN

ROOMS occupied by household at 1 year (or death)

PERSONS in household at 1 year (or death)

CLINIC RECORD

DATE of DEATH

CAUSE of DEATH (Death Certificate)

POST MORTEM

OFFICE

TYPE OF LABOUR

FIXATION OF PRESENTING PART AFTER ONSET OF LABOUR

MATERNAL COMPLICATIONS OF LABOUR & PUERPERIUM

ATTENDANT AT BIRTH

BABY RHESUS TEST

BIRTH LENGTH

CONGENITAL MALFORMATIONS OBSERVED IN THE FIRST TWO WEEKS

BIRTH INJURIES & DISEASES OF THE NEWBORN

FIG. 4.—Health Visitor's Record, 1950 (page 1, front and back). Maternity and Child Welfare Department, City of Birmingham.

Percentage of births to families living with two or more persons per room

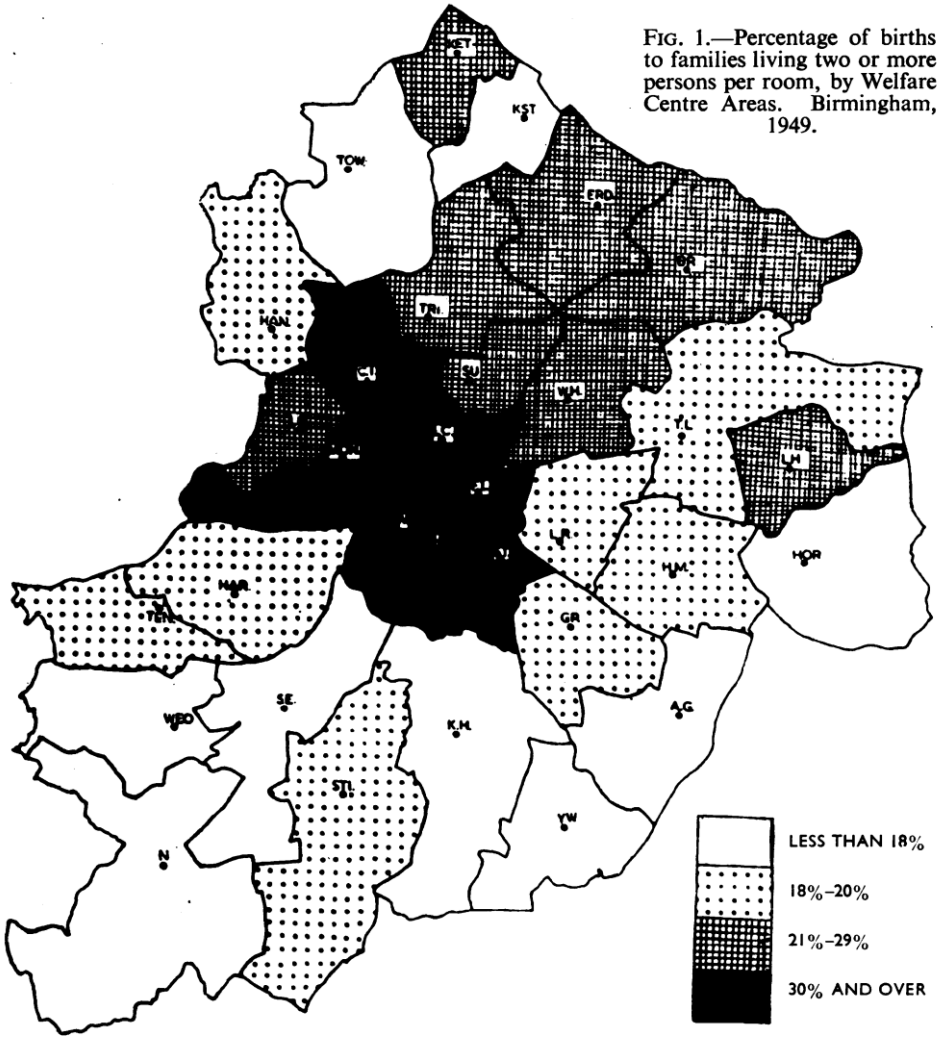
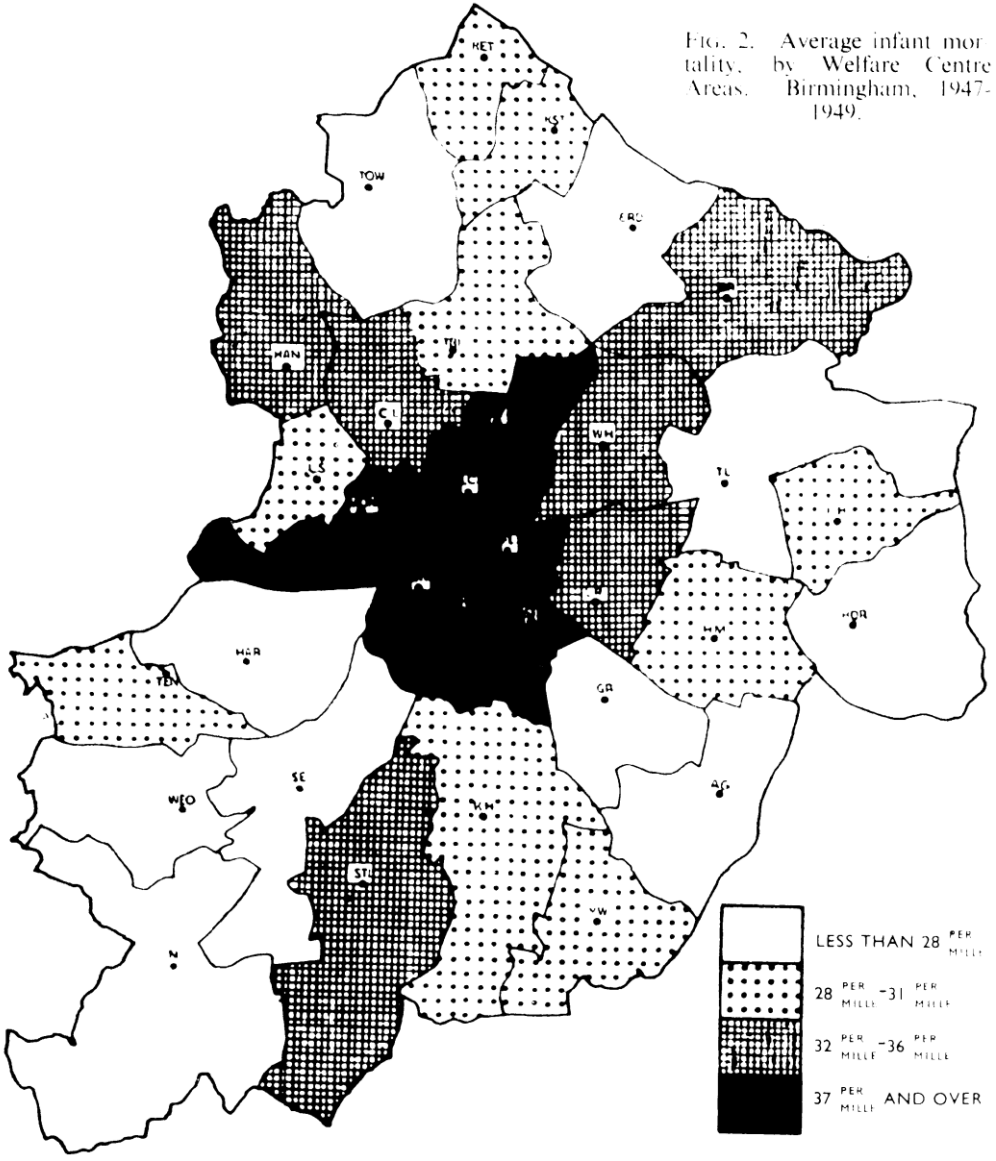


FIG. 1.—Percentage of births to families living two or more persons per room, by Welfare Centre Areas. Birmingham, 1949.

Infant mortality rates



Hour of birth

Brit. J. prev. soc. Med. (1953), 7, 43–59

THE HOUR OF BIRTH

A STUDY OF THE DISTRIBUTION OF TIMES OF ONSET OF LABOUR AND OF DELIVERY THROUGHOUT THE 24-HOUR PERIOD

BY

ENID CHARLES

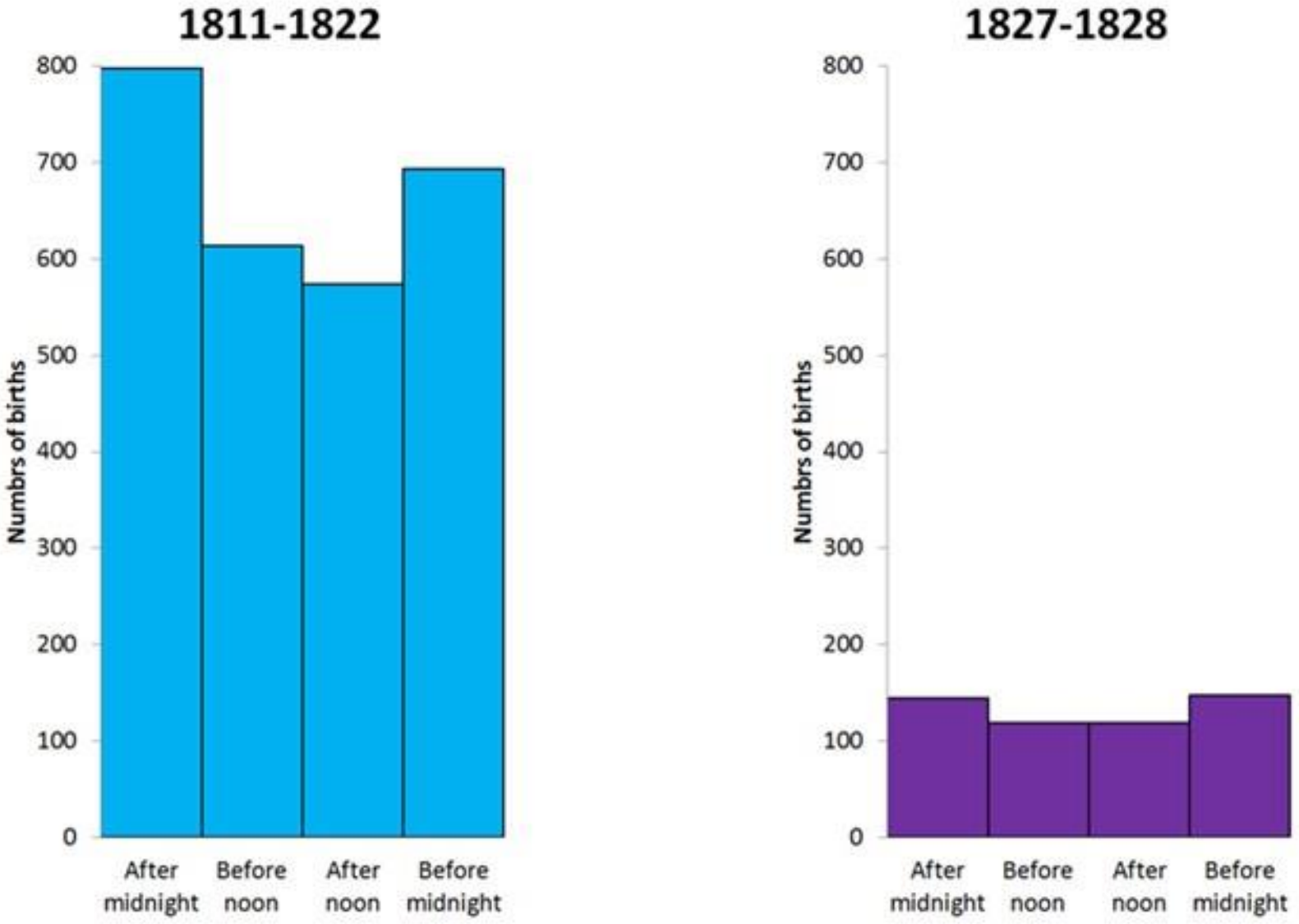
Department of Medical Statistics, University of Birmingham, and Queen Elizabeth Hospital, Birmingham

Births by time of the day, Hôpital St Pierre, Bruxelles 1811-22, 1827-28

HEURES.	NAISSANCES. 1811–1822.	MORTS-NÉS. 1811–1822.	NAISSANCES. 1827–1828.
Après minuit.	798	53	145
Avant midi...	614	51	119
Après midi...	574	59	119
Avant minuit.	694	55	148
TOTAUX....	2680	218	531

Source: Essai de physique sociale, Adolf Quetelet, 1835

Births by time of the day, Hôpital St Pierre, Bruxelles 1811-22, 1827-28



Source: Essai de physique sociale, Adolf Quetelet, 1835

Background to Enid Charles' analysis

Analyses up to the mid twentieth century showed similar patterns, with births being more common at night and in early hours of the morning.

Correspondence in the British Medical Journal in 1952 showed that some analyses of births in the mid twentieth century found similar patterns while others did not.

Birmingham analysis

Time of onset of labour

Recorded by parents rather than clinical staff

Risk of digit preference, described as ‘clumping’

Differences in definitions

Time of birth

Neither of these items were punched onto cards, so analysis of 12,359 births was done manually using data from delivery records.

Purpose of analysis

‘To clarify processes which initiate health parturition’

Exclusions:

a) stillbirths

b) second twins, second and thirds stillbirths

c)specified antenatal complications

d) medical or surgical induction or delivery

e) all presentation other than vertex

f) ‘all congenital malformations of the infant’

If the purpose had been administrative, all births would have been included.

Sources of diurnal rhythms

‘Physical events such as light and temperature impose on the *material* environment a diurnal rhythm …

The normal routine of work, meals and sleep imposes a diurnal rhythm on the *social* environment.’

‘Superimposed on each diurnal pattern of external change are seasonal regularities …’

Tabulations of times of onset and birth

Place of birth – domiciliary / institutional

Season – analysed births in one month periods surrounding equinoxes and solstices

Additional analyses by parity

Remaining births from August 1 to September 7 and from November 1 to December 7 tabulated by parity extracted from health visiting cards.

Results - extract from summary

APPENDIX TABLE A

TIME OF ONSET OF LABOUR—SELECTED CASES, BIRMINGHAM, 1950, 1951

Time of Day	Date of Birth																All Births
	Domiciliary Births								Institutional Births								
	March 8 to April 4	June 8 to July 5	Aug. 1 to Sept. 7		Sept. 8 to Oct. 5	Nov. 1 to Dec. 7		Dec. 8 to Jan. 4	March 8 to April 4	June 8 to July 5	Aug. 1 to Sept. 7		Sept. 8 to Oct. 5	Nov. 1 to Dec. 7		Dec. 8 to Jan. 4	
			Primi-gravidae	Multi-gravidae		Primi-gravidae	Multi-gravidae				Primi-gravidae	Multi-gravidae		Primi-gravidae	Multi-gravidae		
12 Midnight	52	61	14	45	36	10	55	32	59	44	28	28	57	25	42	56	644
1 a.m.	73	77	28	64	66	11	64	57	55	71	45	31	63	30	34	42	811
2 a.m.	89	91	30	82	82	21	64	72	54	64	34	51	49	35	30	62	910
3 a.m.	88	70	23	52	64	8	55	47	55	56	38	35	51	34	27	51	754
4 a.m.	68	72	8	51	59	15	64	52	52	46	24	29	46	24	26	50	686
5 a.m.	47	32	10	34	41	9	40	39	26	39	18	29	44	17	17	33	475
6 a.m.	58	48	9	59	62	10	31	45	41	44	25	28	34	13	24	27	558
7 a.m.	47	51	11	39	38	4	37	34	30	38	15	28	34	15	26	35	482
8 a.m.	48	45	6	44	45	8	41	45	25	24	20	26	24	6	17	27	451
9 a.m.	53	32	9	36	29	6	32	31	29	2[illegible]	21	20	23	22	21	36	424
10 a.m.	47	31	6	32	29	5	24	27	25	2[illegible]	20	23	18	20	13	29	370
11 a.m.	34	32	8	23	26	4	28	23	29	22	20	16	19	15	19	28	346
12 Noon	21	25	5	22	27	5	21	22	36	33	16	18	29	14	21	16	331

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Timing of onset of labour by parity, 4-hour moving averages

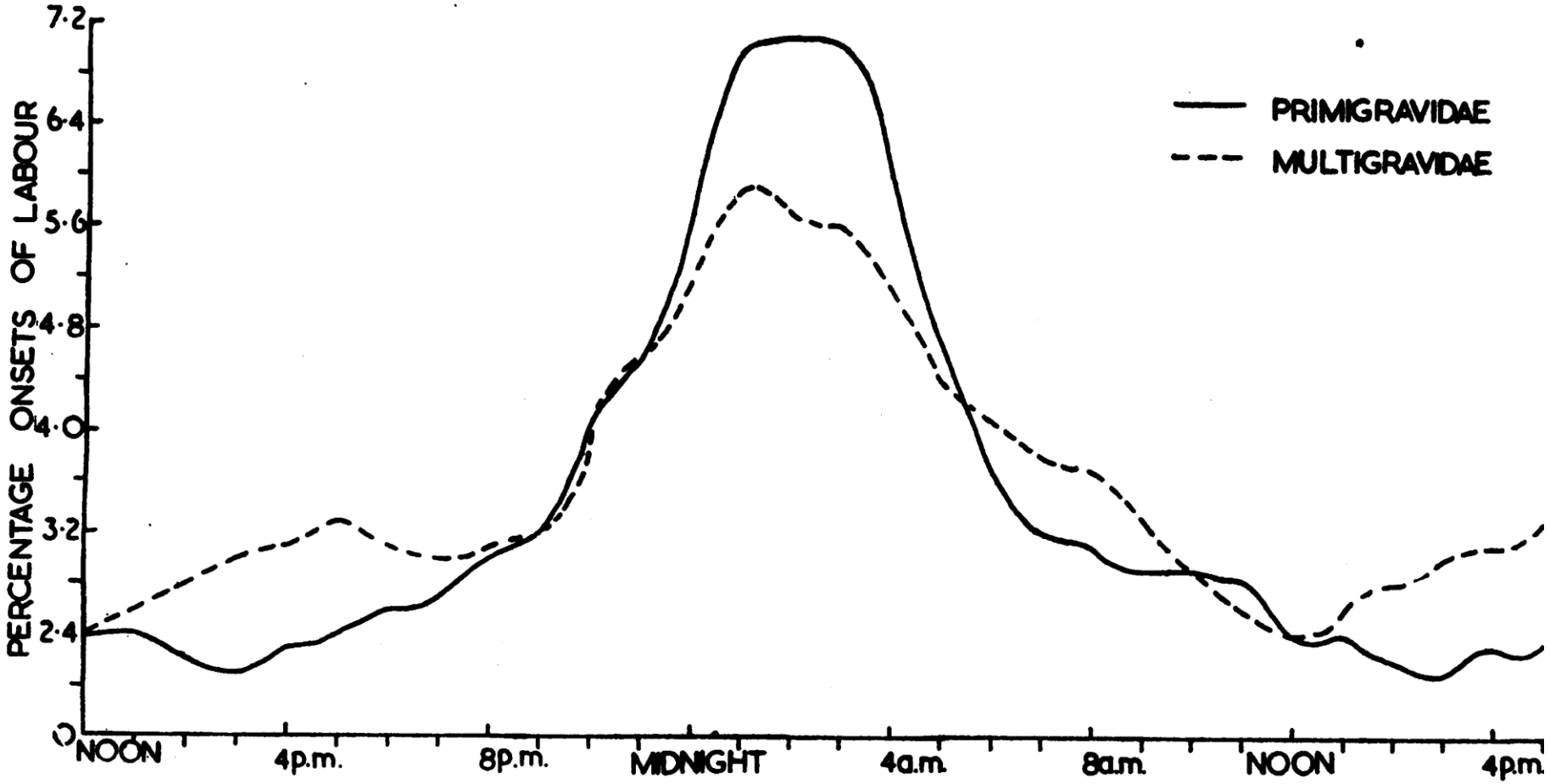


FIG. 3.—Percentage distribution of times of onset of labour by parity. 4-hour moving averages.

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Timing of onset of labour by place of birth, 4-hour moving averages

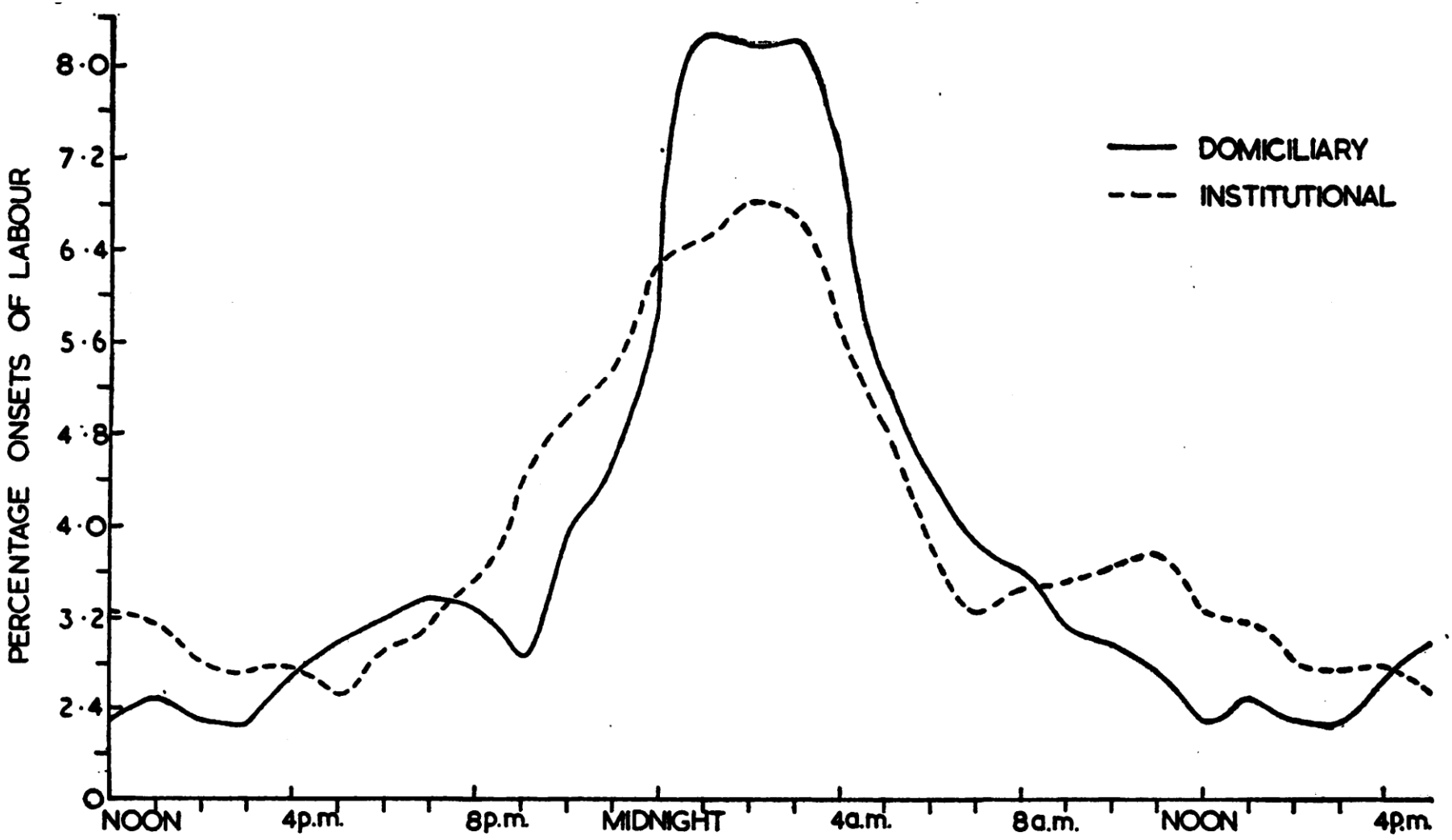


FIG. 5.—Percentage distribution of times of onset of labour in primigravidae. Domiciliary and institutional onsets in the month of August, 4-hour moving averages.

Timing of onset of labour by season

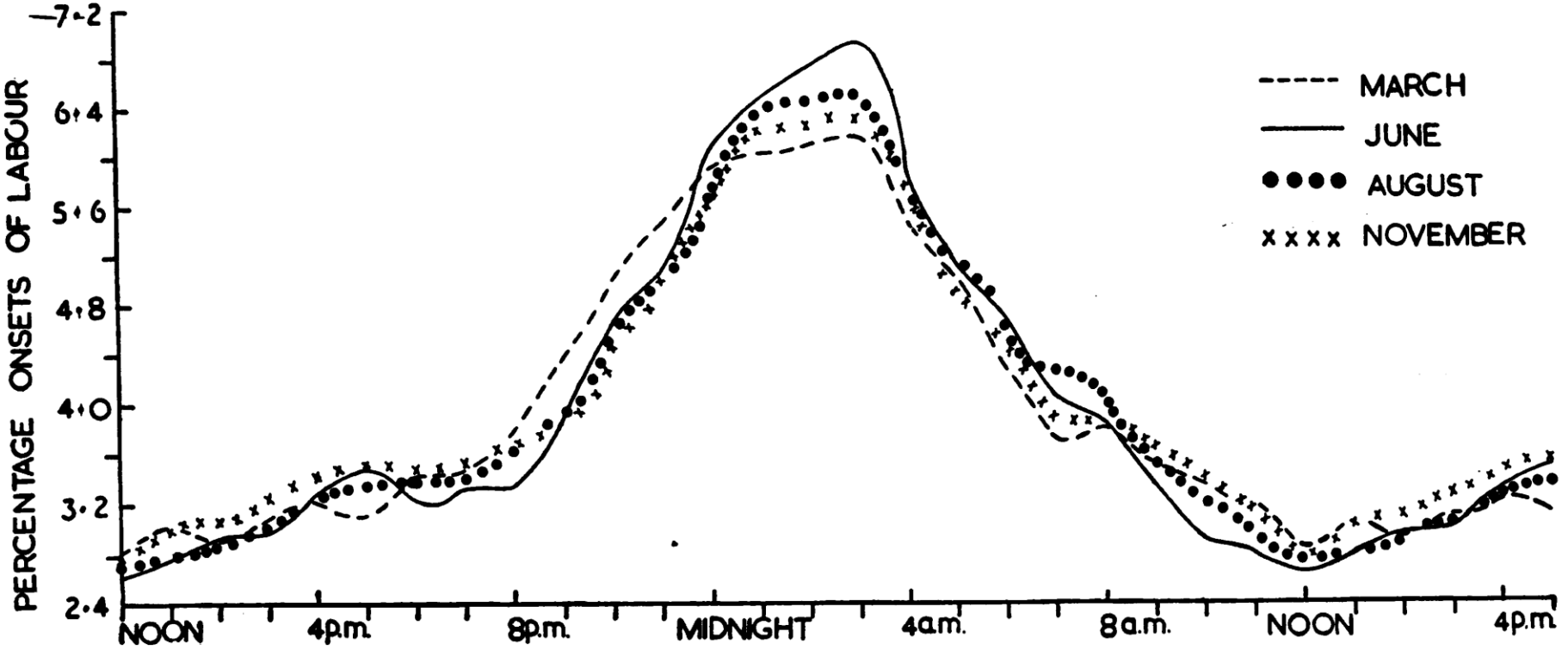


FIG. 7.—Percentage distribution of times of domiciliary onsets of labour in March, June, August, and November.

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Timing of all births

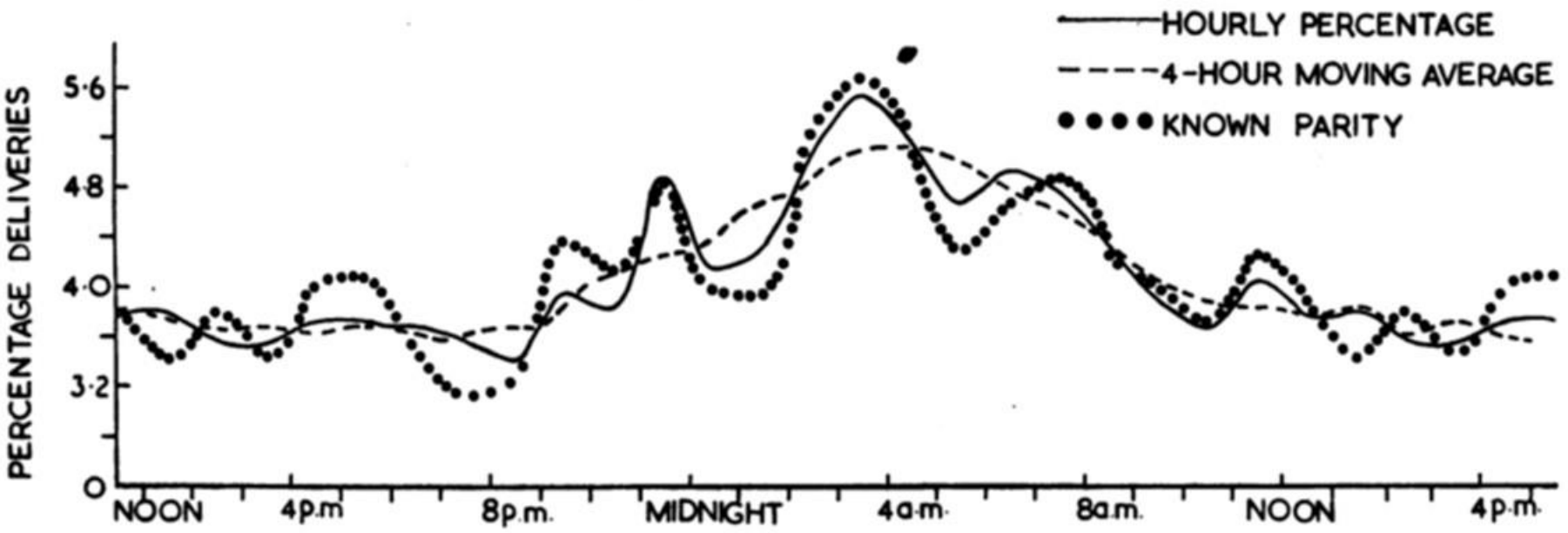


FIG. 10.—Percentage distribution of times of delivery in all selected births.

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Timing of birth of primigravidae

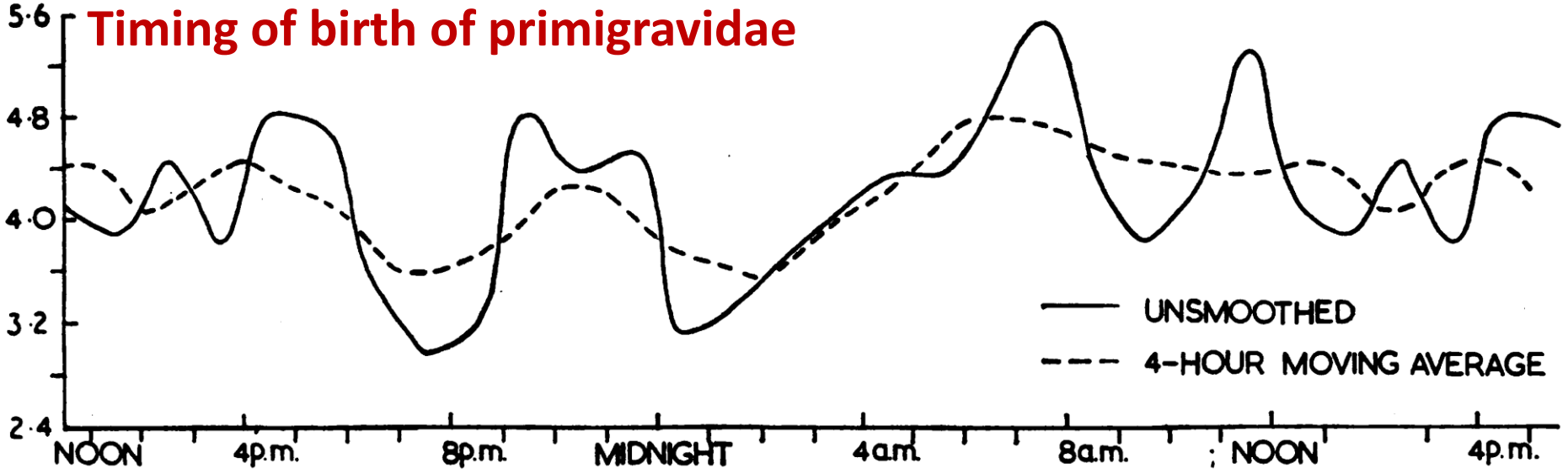


FIG. 11.—Percentage distribution of times of delivery of primigravidae, unsmoothed and 4-hour moving averages.

Timing of birth of multigravidae

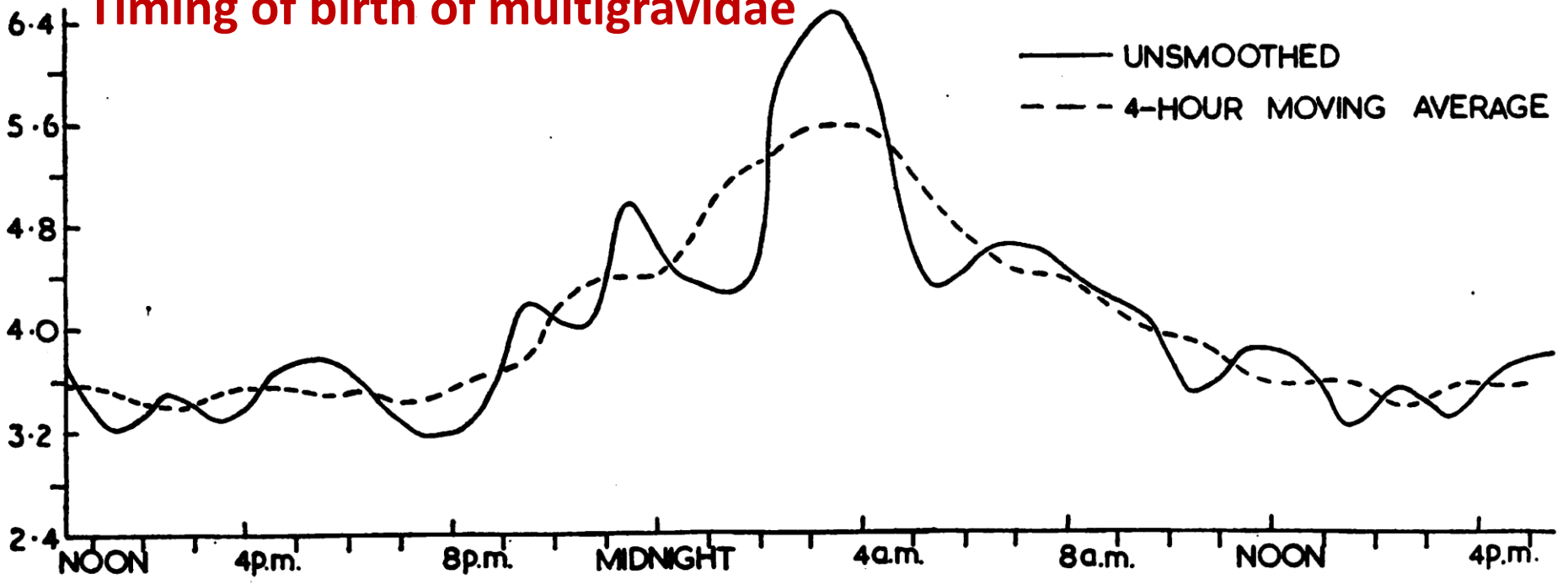


FIG. 12.—Percentage distribution of times of delivery of multigravidae, unsmoothed and 4-hour moving averages.

Distribution of duration of labour of primigravidae by onset

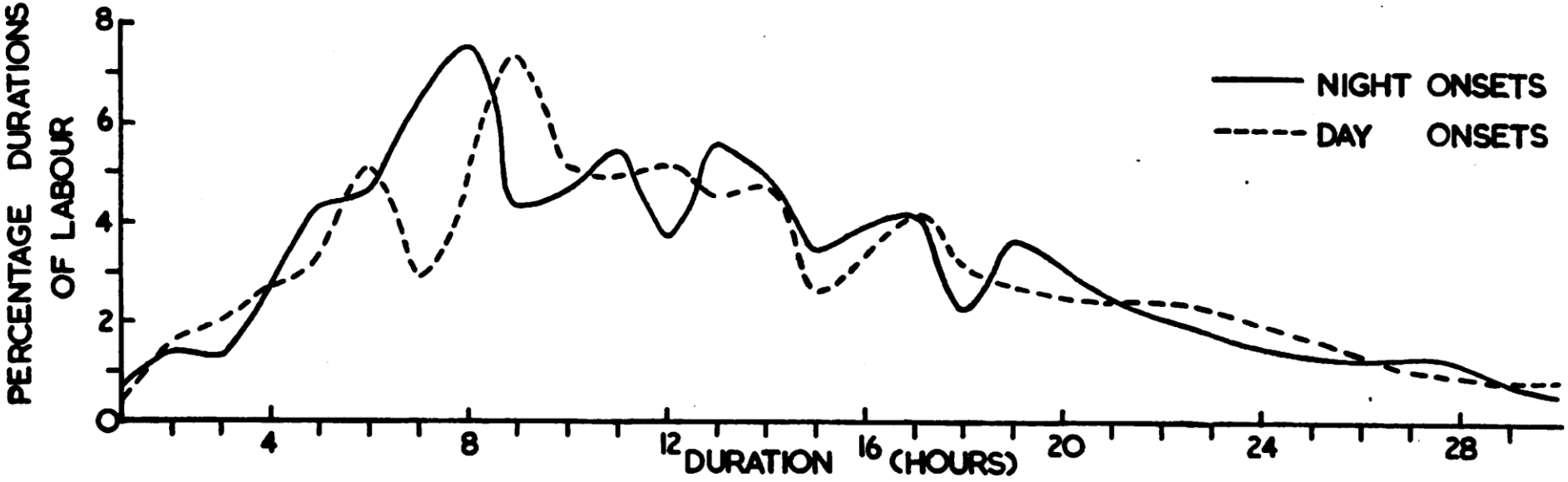


FIG. 13.—Percentage distribution of durations of labour by day and night onset in primigravidae.

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Distribution of duration of labour of multigravidae by time of onset

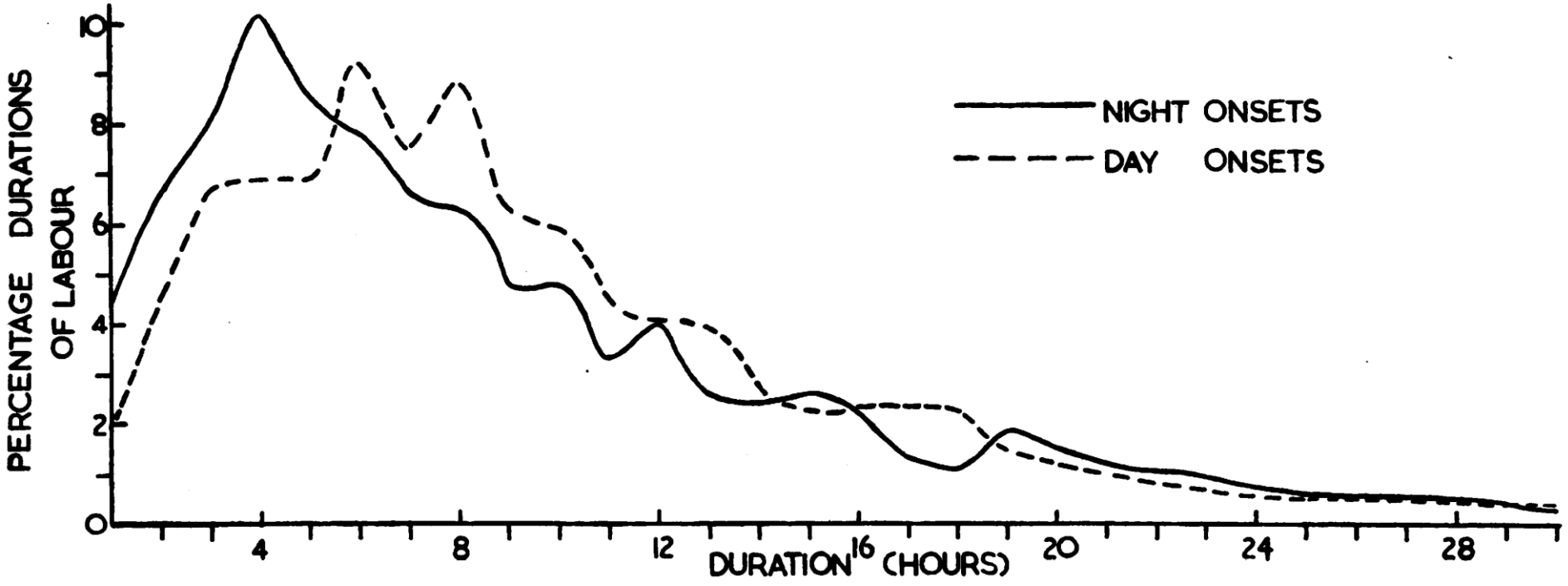


FIG. 14.—Percentage distribution of durations of labour by day and night onset in multigravidae.

Source: Enid Charles, Hour of birth. Br J prev soc Med.1953

Some summary comments

‘ With respect to diurnal rhythm, we have seen that it is necessary to draw a sharp distinction between solar time and that of the socially calibrated clock.’

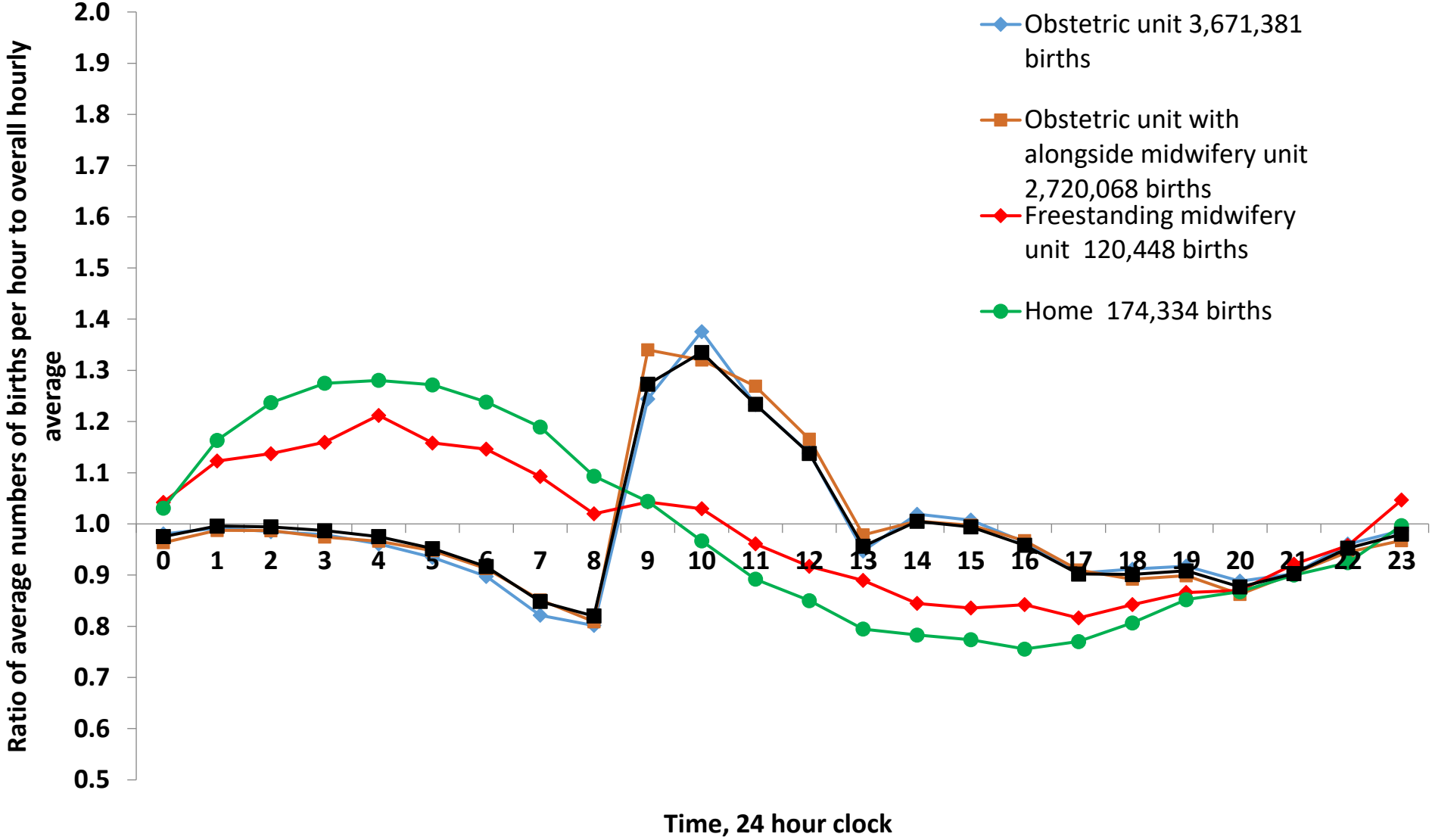
‘The results obtained suggest a tendency for normal labour to start more readily when the mother is at rest, if not actually asleep.’

Summary comments

‘The author, no less than the reader, is well aware that this inquiry has raised many more questions than its outcome can answer.

One reason for this is to be found in the limitation of hand processes. Owing to the complexity of the phenomena, more comprehensive and decisive conclusions would be justifiable only if based on more elaborate cross-classification, involving recourse to a much larger number of cases. Without mechanization, the labour involved in an inquiry planned on such a scale would be prohibitive.’

Variations in singleton births by time of day in NHS maternity units and at home, England and Wales, 2005-14



1953 onwards

1953 Split up with Hogben.

Started work with World Health Organisation in many countries in South East Asia.

Produced many reports, not widely available.

1959 ‘Retired’ to the United States, where her sons and daughters then lived.

Continued to work for World Health Organisation on a consultancy basis until 1962.

Eventually returned to England because of opposition to US policies in Vietnam. Joined a retirement community in Exeter and died in Exeter, March 26, 1972

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Charles E. Statistical utilization of maternity and child welfare records. *Brit. J. soc. Med. (1951), 5, 41-61*

Charles E. Hour of birth. *Br J prev soc Med.1953; 7: 43-59*