

MADRAS RECORD OFFICE.

Government of Madras.

Judicial DEPARTMENT.

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310

*Proceedings of the Madras Government, Judicial Department,
27th February 1867.*

No. 238. Read the following letter from the Honorable R. S. ELLIS, c. B., Sanitary Commissioner for Madras, to the Chief Secretary to Government, Fort Saint George; dated Madras, 2nd February 1867, No. 474.

Enclosures.
3 copies of the Report of the Army Sanitary Commission on Methods of estimating the Mortality in Indian Prisons.

I have the honor to forward the accompanying Report of the Army Sanitary Commission on Methods of estimating the Mortality in Indian Prisons.

2. The uniform method given in page 3 has been drawn up by Dr. W. Farr, the Registrar General of England, and the Army Sanitary Commission recommend its adoption in all Prisons at Home and abroad.

3. I would suggest that this Report, of which I enclose three copies, should be referred to the Inspector General of Jails, with a view to its adoption in all the Jails of the Presidency.

4. A similar method of computing the mortality rates in the Army might probably, with advantage, be adopted by the Principal Inspector General of British and Indian Troops.

No. 239. ORDER THEREON, 27th February 1867, No. 310.

A copy of the Report received with the foregoing letter will be furnished to the Inspector General of Jails, who will state whether the methods of estimating the mortality in Indian Prisons, referred to in Mr. Ellis' letter, may be introduced into the Jails of this Presidency.

2. A copy will also be sent to the Military Department with reference to paragraph 4.

(True Extract).

Chief Secretary.

To the Inspector General of Jails, with the Report:
" Military Department, do.
" Sanitary Commissioner.

Exd. J. Tulloch.

Recd. 1/3/07

REPORT

OF THE

ARMY SANITARY COMMISSION

ON

METHODS OF ESTIMATING THE MORTALITY IN INDIAN PRISONS.

The Commission having been requested to obtain for the Government of India the methods in use for calculating the death rates in English and French Prisons, with the view of arriving at a uniform register and account of the mortality in Indian Prisons, placed themselves in communication with the Home Office and with the French Government through the medium of the Foreign Office.

And they have now to report the results of their enquiry as follow :—

1st.—As regards English Prisons,—from the peculiar circumstances of the management of these prisons no uniform method of obtaining the mortality is in use.

2nd.—As regards French Prisons,—they find that there is a uniform method of record of the following kind :—

a. In all prisons there is a register of deaths.

b. All deaths are besides entered in the medical records of the prison.

3rd.—The deaths in Prisons are reported to the central administration in a sheet sent to the Director of each establishment, and thus the numbers are checked and entered in tables intended to show the deaths in each prison and also in the prisons collectively. Besides which the deaths appear in the annual medical reports of the prisons.

4th.—In order to obtain the prison population on which to calculate the mortality, the following methods are adopted :—

a. The admissions of the year are added to the remaining prisoners on the last day of the preceding year, the dismissals from

all causes, including death, are deducted from this sum, and the remainder is the prison population on the last day of the year.

b. To obtain the mean prison population of the year, the sum of all the days of imprisonment of all classes of prisoners is divided by the number of days in the year. The quotient gives the mean prison population.

5th.—Periodical reports are published on Prison Statistics containing the mortality of each prison and for each class of prisoners, and there is also a periodical medical report giving the diseases and the deaths from each disease.

6th.—But as the published reports did not appear to the Commission to contain all the information which it was desirable to ascertain, they communicated with the Registrar General of England, who kindly afforded his aid in framing a method of obtaining the statistics of gaol mortality of such a nature as to give uniform results comparable with those obtained for the general civil population. This method, drawn up by Dr. Farr, is much superior to any at present in use, and is accompanied by the necessary forms. We have appended it to this report, with the view to its being adopted in all prisons at home and abroad.

J. HOPE GRANT, Q.M.G., and President.

DOUGLAS GALTON, Assistant Under Secy.
of State for War.

JOHN SUTHERLAND.

T. G. LOGAN, Inspector General of Hospitals.

EDWARD BELFIELD, Deputy Director of Works, War Office.

PROBY T. CAUTLEY, Member of the Council of India.

J. RANALD MARTIN, Inspector General of Hospitals.

ROBERT RAWLINSON, Local Government Act Office.

FREDERICK, Secretary,
Army Sanitary Commission,
War Office, 20th April 1866.

Uniform Method of determining the Mortality Rates of Prisoners in Gaols.

To determine the rate of mortality among prisoners in gaols, so as to admit of its comparison with the rate of mortality among other classes of the population, the following rules should be observed:—

1. The investigation should be annual.
2. The prison register should be kept so as to include all the required facts, such as (1), name; (2), age, as far as it can be ascertained; (3), state of health at the date of entry, and disease, if any; state of health at the date of discharge, and if sick at date of discharge the disease to be recorded.

3. From this register the daily number of prisoners in gaol could be taken, and the sum of the daily numbers (say 39,162) divided by the days in the year 365 would give for quotient the average number of prisoners (say $P = 107$). This would be useful as a check on dietaries, and in other ways.

The deaths ($= D$) in the year, divided by the average number of prisoners (P) would give the rate of mortality per annum ($= \frac{D}{P} = m_1$). Thus, if $P = 1,000$ and $D = 80$, then $\frac{D}{P} = \frac{80}{1,000} = .08 = m_1$. Multiply m_1 by 100, and we have the rate of mortality per cent. per annum $= 8.0$.

Example.

Take 300 as the average number of prisoners of the age 20-25, and 15 as the deaths in a year, then—

$$\text{As } 300 : 15 :: 100 : 5$$

$$\frac{15}{300} = \frac{5}{100}$$

5 = annual rate of mortality per cent. at age 20-25.

The same method is applicable to the determination of the mortality among prisoners of any particular age.

4. The deaths per cent. out of a given number passing through the gaols can be also determined. Thus, if out of 10,000 going through the gaols 80 die, then $\frac{80}{10,000} = .008 = m_2$. Multiply

m_2 by 1,000, and we find that 8 in 1,000 prisoners entering die in the gaols in an indefinite time.

Put A for annual admissions, then if the annual discharges, including deaths, equal A , we can determine the mean term of residence by this rule: *Divide the mean population (P) by admissions to obtain mean term of residence in years or fractions of a year.*

Example.

$$\frac{P}{A} = \frac{250}{1,000} = .25 \text{ year} = \frac{1}{4} \text{ of a year, or multiplying } 365 \text{ by } \frac{1}{4} = 91 \text{ days.}$$

5. To show how length of imprisonment affects the rate of mortality, the prisoners should be classified in the form shown in Table 1.

Where there is little fluctuation in the admissions and discharges, the rate of mortality in each period of imprisonment can be determined from the facts in such a table (1). Thus, if we divide the year's deaths in the first month of imprisonment by the average numbers living in that month of imprisonment, the mortality in that month is determined. The same method is applicable to the second, third, and other months, or to years.

6. Again, by taking the total numbers discharged as the basis, a useful table in the form shown in Table 2 may be constructed, showing out of a given number entering how many remain one month, two months, three months, &c, in gaol.

7. It would be desirable also to show the average numbers on the sick list (S), as reported daily or weekly by the medical officer in charge. Thus the numbers sick divided by the mean population would give the average sickness rate, which being multiplied by 100 would be the proportion of constantly sick to every 100 prisoners.

8. Again, the number of cases of sickness occurring in the year (C) should be recorded, and these cases divided by the mean population would give the morbidity rate, which being multiplied by 100 would give the cases of sickness per annum to every 100 of the gaol population.

9. Where it is possible, the sickness and the mortality from the principal diseases should be shown. (See *Form of Registrar General's Weekly Return*, Table 4.)

Other matters of some importance may be discussed, such as (1), the sickness and mortality in the several months of the year; (2), in

the several seasons; (3), under different dietaries; and (4), different kinds of labor or punishment.

W. FARR.

GENERAL REGISTER OFFICE,
1866.

FORMULAS.

P = Average number of prisoners, or mean population of the gaols.

D = Deaths of prisoners in a year.

A = Annual admissions.

E = Exits, either by discharge or death, annually.

S = Average numbers on the sick list.

C = Cases of sickness occurring in the year.

m = Mortality rate.

Then:—

(1) $\frac{D}{P} = m_1$; and $100 m_1$ = annual rate of mortality per cent.

(2) $x = \frac{P}{A}$ = average term of residence in years or fractions of a year. Multiply x by 365 or 366, and we have the term in days.

But $\frac{D}{A} = m_2$ = the death rate in the time x , then, population being constant, if mortality is proportional to time.

$$m_2 : m_1 :: x : 1.$$

$$\text{And } m_2 = x m_1 = \frac{P}{A} \cdot \frac{D}{P} = \frac{D}{A} \cdot m_1 = \frac{m_2}{x} =$$

$$\frac{D}{A} \cdot \frac{A}{P} = \frac{D}{P} = \text{annual rate of mortality.}$$

The mortality rate, it is assumed, is constant and proportional to the time. If the admissions (A) do not equal the exits (E), then $\frac{A+E}{2}$ may generally be substituted for A in the preceding equation.

(3) $\frac{S}{P} = s_1$ = average sickness rate; and $100 s_1$ = proportion of constantly sick to every 100 prisoners.

(4) $\frac{C}{P} = c_1$; and $100 c_1$ = the cases of sickness per annum to every 100 of the gaol population.

(5) $\frac{D}{C} = m_3$; and $100 m_3$ = deaths to every 100 sick cases.

(6) $\frac{D}{S} = m_4$; and $100 m_4$ = annual rate of mortality per cent. among the sick population of the prisons.

Time in Prison.	In Prison on					Discharged during the year in various ways at the several Stages of Imprisonment in Column 1.			
	January 1, 1866.	April 1, 1866.	July 1, 1866.	October 1, 1866.	January 1, 1867.	Dead.	Sick.	In sound Health.	
MONTHS.									
Under 1 month.	70	85	80	65	64	3	2	218	
1-2	69	57	63	51	43	2	2	502	
2-3									
3-5									
6-9.									
9-12									
YEARS.									
0-1									
1-2									
2-3									
3-4									
4-5.									
5-10									
10-15									
15-20									
20-25									

TABLE 2.

Period of Imprisonment complete.	Prisoners remaining.	Total discharged.	Prisoners discharged				
			By Death.	By expiration of Term of Imprisonment.	By transfer to another Prison.	By Escape.	By discharge or pardon on the ground of Sickness.
0 and under 1 month...	64	256	3	200	...	2	15
1 month...							
2 "							
3 "							
6 "							
9 "							
1 year ...							
2 "							
3 "							
4 "							

In another Table the proportions remaining may be shown to 1,000 entering the prison.
The 1,000 in Column 2 would be placed against 0 in Column 1.

TABLE 3.
ANNUAL RATE OF MORTALITY at the respective Ages, 1866.

Ages.	Average Numbers living.	Deaths.	Rate of Mortality per Cent.
Under 15	300	15	5
15—20			
20—25			
25—30			
30—35			
35—40			
40—45			
45—50			
50—55			
55—60			
60—65			
All ages			

9
TABLE 4.
FORM OF REGISTRAR GENERAL'S WEEKLY RETURN.
DEATHS in LONDON, from ALL CAUSES, Registered in the TWENTY-
FOURTH WEEK of the Year 1866.

Class.	CAUSES OF DEATH.	In the Week ending Saturday, June 16, 1866. (Mean Temperature 58.5°.)					
		Deaths of Persons of the Ages					
		ALL AGES.	Under 20 Years.	20 and under 40.	40 and under 60.	60 and under 80.	80 Years and upwards.
	ALL CAUSES	1370	705	215	193	221	33
	SPECIFIED CAUSES	1364	701	214	192	221	33
	(CLASSES.)						
I.	ZYMOTIC DISEASES	359	201	23	22	16	2
II.	CONSTITUTIONAL	251	73	95	60	23	3
III.	LOCAL	530	215	69	98	144	12
IV.	DEVELOPMENTAL	160	100	8	4	34	14
V.	VIOLENT DEATHS	61	22	23	8	7	1
	(ORDERS.)						
I.	1. MIASMATIC DISEASES	324	260	23	16	15	1
	2. ENTHEMIC	13	9	3	...	...	1
	3. DIETIC	21	12	2	6	1	...
	4. PARASITIC	1	1	...	...	...	...
II.	1. DIATHETIC	36	2	4	15	13	2
	2. TUBERCULAR	218	71	91	45	10	1
III.	1. DISEASES OF NERVOUS SYSTEM	164	81	11	21	48	3
	2. " OF ORGANS OF CIRCULATION	71	12	12	29	27	1
	3. " OF RESPIRATORY ORGANS	214	111	20	27	51	5
	4. " OF DIGESTIVE ORGANS	49	13	7	16	10	3
	5. " OF URINARY ORGANS	19	12	7	4	5	1
	6. " OF ORGANS OF GENERATION	7	3	...	...	2	...
	7. " OF ORGANS OF LOCOMOTION	2	...	...	...	...	...
	8. " OF INTEGUMENTARY SYSTEM	4	12	...	1	1	...
IV.	1. DEV. DISEASES OF CHILDREN	42	42	...	...	...	...
	2. " OF ADULTS	8	...	7	1	...	...
	3. " OF OLD PEOPLE	46	...	...	...	32	14
	4. DISEASES OF NUTRITION	64	58	1	3	2	...
V.	1. ACCIDENT OR NEGLIGENCE	46	19	16	5	5	1
	2. HOMICIDE	4	3	1	...	...	...
	3. SUICIDE	11	...	6	3	2	...
	4. EXECUTION	...	...	...	...	...	...
	5. VIOLENT DEATHS NOT CLASSED	...	...	...	...	...	...
	SUDDEN DEATHS, CAUSE UNASCERTAINED	4	2	1	1	...	...
	CAUSES NOT SPECIFIED	2	2	...	...	...	...

† Order 2, comprising Violent Deaths in Battle is omitted, as inapplicable to the civil population.

DEATHS in LONDON, from ALL CAUSES, Registered in the TWENTY-
FOURTH WEEK of the Year 1866—*Cont.*

Class.	CAUSES OF DEATH.	In the Week ending Saturday, June 16, 1866. (Mean Temperature 58.5°.)					
		Deaths of Persons of the Ages					
		ALL AGES.	Under 20 Years.	20 and under 40.	40 and under 60.	60 and under 80.	80 Years and up- wards.
I.	ORDER 1.						
	1. Small-pox ...	39	32	5	2	7	...
	2. Measles ...	80	79	1	...	...	...
	3. Scarletina ...	31	29	2	...	...	...
	4. Diphtheria ...	8	7	1	...	...	...
	5. Quinsy ...	3	2	1	...	...	...
	6. Croup ...	11	11	...	...	...	...
	7. Whooping-cough ...	71	71	...	...	...	...
	8. Typhus (and Infantile fever) ...	40	13	9	10	8	...
	9. Erysipelas ...	4	2	1	...	1	...
	10. Metria ...	3	...	3	...	...	...
	11. Carbuncle ...	1	...	...	...	1	...
	12. Influenza ...	...	...	...	...	...	...
	13. Dysentery ...	2	2	...	...	...	...
	14. Diarrhoea ...	20	15	1	...	...	...
	15. Cholera ...	3	2	...	1	3	1
	16. Ague ...	1	1	...	...	...	...
	17. Remittent fever ...	1	1	...	...	...	...
	18. Rheumatism ...	5	1	...	2	2	...
	19. Other Zymotic diseases ...	1	1	...	...	...	...
	ORDER 2.						
	1. Syphilis ...	9	7	2	...	...	...
	2. Stricture of Urethra ...	1	...	1	...	...	...
	3. Hydrophobia ...	3	2	...	...	...	...
	4. Glanders ...	...	...	...	...	...	1
	ORDER 3.						
	1. Privation ...	2	1	...	1	...	...
	2. Want of Breast-milk ...	9	9	...	...	...	...
	3. Purpura and Scurvy ...	5	2	1	1	1	...
	4. Alcoholism {a Del. Tremens b Intemperance...	...	...	1	4	...	...
	ORDER 4.						
	1. Thrush ...	1	1	...	...	...	...
	2. Worms, &c. ...	...	...	...	...	...	...
II.	ORDER 1.						
	1. Gout ...	3	...	...	2	1	...
	2. Dropsy ...	11	1	1	5	3	1
	3. Cancer ...	19	1	3	8	6	1
	4. Noma ...	...	...	...	...	...	...
	5. Mortification ...	3	...	...	...	3	...

DEATHS in LONDON, from ALL CAUSES, Registered in the TWENTY-
FOURTH WEEK of the Year 1866.—*Cont.*

Class.	CAUSES OF DEATH.	In the Week ending Saturday, June 16, 1866. (Mean Temperature 58.5°.)					
		Deaths of Persons of the Ages					
		ALL AGES.	Under 20 Years.	20 and under 40.	40 and under 60.	60 and under 80.	80 Years and upwards.
III.	ORDER 2.						
	1. Scrofula ...	11	8	2	1	...	...
	2. Tabes Mesenterica ...	15	12	3	1	...	...
	3. Phthisis ...	170	31	85	43	10	1
	4. Hydrocephalus ...	23	20	3	...	...	...
	ORDER 1.						
	1. Cephalitis ...	15	15	...	...	...	...
	2. Apoplexy ...	40	6	4	10	20	...
	3. Paralysis ...	29	2	2	6	17	3
	4. Insanity ...	1	...	...	...	1	...
	5. Chorea ...	...	...	...	...	...	...
	6. Epilepsy ...	10	3	4	2	1	...
	7. Convulsions ...	43	43	...	...	...	...
	8. Brain Disease, &c. ...	21	7	1	3	9	1
	ORDER 2.						
	1. Pericarditis ...	1	...	1	...	...	...
	2. Aneurism ...	...	...	...	...	...	...
	3. Heart Disease, &c. ...	70	2	11	29	27	1
	ORDER 3.						
	1. Laryngitis ...	6	4	1	1	...	...
	2. Bronchitis ...	112	43	4	18	33	4
	3. Pleurisy ...	4	1	1	1	...	...
	4. Pneumonia ...	73	55	12	3	8	...
	5. Asthma ...	2	...	...	...	2	...
	6. Lung Disease, &c. ...	13	3	2	4	3	...
	ORDER 4.						
	1. Gastritis ...	3	1	...	1	1	...
	2. Enteritis ...	2	1	1	...	...	...
	3. Peritonitis ...	3	...	1	1	...	2
	4. Ascites ...	4	1	...	1	...	...
	5. Ulceration of Intestines ...	2	1	...	1	...	...
	6. Hernia ...	2	1	...	1	1	...
	7. Ileus ...	3	1	...	...	...	...
	8. Intussusception ...	1	1	...	...	...	...
	9. Stricture of Intestines ...	...	...	...	...	...	...
	10. Fistula ...	...	...	...	...	...	...
	11. Stomach Disease, &c. ...	7	3	...	1	3	...
	12. Pancreas Disease, &c. ...	...	...	...	...	...	...
	13. Hepatitis ...	5	...	1	4	...	...
	14. Jaundice ...	4	1	1	...	1	1
	15. Liver Disease, &c. ...	13	2	2	5	3	...
	16. Spleen Disease, &c. ...	1	1	...	...	...	...

DEATHS in LONDON, from ALL CAUSES, Registered in the TWENTY-
FOURTH WEEK of the Year 1866.—Cont.

Class.	CAUSES OF DEATH.	In the Week ending Saturday, June 16, 1866. (Mean Temperature 58.5°.)					
		Deaths of Persons of the Ages					
		ALL AGES.	Under 20 Years.	20 and under 40.	40 and under 60.	60 and under 80.	80 Years and upwards.
	ORDER 5.						
	1. Nephritis	...	...	...	...	...	...
	2. Ischuria	...	...	...	...	...	...
	3. Nephria (Bright's disease)	...	...	...	...	...	...
	4. Diabetes	...	...	...	...	...	...
	5. Stone	...	...	...	...	...	...
	6. Cystitis	...	...	...	...	...	...
	7. Kidney Disease, &c.	...	...	...	...	...	...
	ORDER 6.						
	1. Ovarian Dropsy.	...	...	...	...	...	...
	2. Uterus Disease, &c.	...	...	...	...	...	...
	ORDER 7.						
	1. Arthritis	...	...	...	...	...	...
	2. Joint Disease, &c.	...	...	...	...	...	...
	ORDER 8.						
	1. Phlegmon	...	...	...	...	...	...
	2. Ulcer	...	...	...	...	...	...
	3. Skin Disease, &c.	...	...	...	...	...	...
	ORDER 1.						
	1. Premature Birth	...	...	...	...	...	...
IV.	2. Cyanosis	...	...	...	...	...	...
	3. Spina Bifida	...	...	...	...	...	...
	4. Other Malformations	...	...	...	...	...	...
	5. Teething	...	...	...	...	...	...
	ORDER 2.						
	1. Paramenia	...	...	...	...	...	...
	2. Childbirth (see Metria)	...	...	...	...	...	...
	ORDER 3.						
	1. Old Age	...	...	...	...	...	...
	ORDER 4.						
	1. Atrophy and Debility	...	...	...	...	...	...

DEATHS in LONDON, from ALL CAUSES, Registered in the TWENTY-
FOURTH WEEK of the Year 1866.—Cont.

Class.	CAUSES OF DEATH.	In the Week ending Saturday, June 16, 1866. (Mean Temperature 58.5°.)					
		Deaths of Persons of the Ages					
		ALL AGES.	Under 20 Years.	20 and under 40.	40 and under 60.	60 and under 80.	80 Years and upwards.
V.	ORDER 1. (ACCIDENT OR NEGLIGENCE.)						
	1. Fractures and Contusions... ..	...	...	...	...	...	...
	2. Wounds... ..	...	...	...	...	...	...
	3. Burns and Scalds	...	...	...	...	...	...
	4. Poison	...	...	...	...	...	...
	5. Drowning	...	...	...	...	...	...
	6. Suffocation	...	...	...	...	...	...
	7. Otherwise	...	...	...	...	...	...
	ORDER 3. (HOMICIDE.)						
	1. Murder and Manslaughter	...	...	...	...	...	...
	ORDER 4. (SUICIDE.)						
	1. Wounds { Gunshot	...	...	...	...	...	...
	{ Cut, Stab	...	...	...	...	...	...
	2. Poison	...	...	...	...	...	...
	3. Drowning	...	...	...	...	...	...
	4. Hanging... ..	...	...	...	...	...	...
	5. Otherwise	...	...	...	...	...	...
	ORDER 5. (EXECUTION.)						
	1. Hanging... ..	...	...	...	...	...	...
	Violent Deaths (not classed)	...	...	...	...	...	...
	Sudden Deaths (Cause unascertained)	...	...	...	...	...	...
	Causes not specified or ill-defined	...	...	...	...	...	...

NOTE.—Cases of "rheumatic fever" are classed with "rheumatism;" of "hæmorrhage" and "abscess" with the diseases of the organs affected. As "stricture of the urethra" is almost invariably the result of gonorrhœa, it is classed as I.; 2; 2

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Sanitary Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Read letter from the Sanitary
Commissioner for Madras.

/ Dated 2nd Feb. 1867. No 474/

Order. 27 February 1867 No 310.

A copy of the Report received
with the foregoing letter will
be furnished to the Inspector
General of Sails, who will
state whether the methods
of estimating the mortality
in Indian Prisons referred
to in Mr Ellis' letter, may
be introduced into the
Sails of this Presidency.

A copy will also be sent
to the Military Department
with reference to para 4.

To Insp: Genl: of Sails with the Report
Military Department do
Sanitary Commissioner

disp 1/3/67.

Journal 1867. Department.

No. 310.

PROCEEDINGS OF GOVERNMENT.

Feb 51.

Dated 29 February 1867.