Measuring the outcome of contact tracing

2: The responsibilities of the health worker and the outcome of contact investigations

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SUMMARY The previous paper (Satin and Mills, 1978) concerned information on patients who were interviewed by health workers in five selected clinics*; information on the contacts named by these patients was similarly analysed. This paper describes and evaluates the activities of the health workers and the outcome of contact investigations. At all stages of the contact tracing process, differences were observed between men and women. It was found that more than half of the male contacts and half the female contacts were known to have been examined. Of those contacts examined, at least two-thirds of them attended the same clinic as the patient who had named them, and 85% of these contacts were found to have a treatable condition. It will be seen that the concept of success or effectiveness of contact tracing is complex in definition and measurement.

Introduction

A Health Education Council project that studied the effectiveness of contact tracing was described in the previous paper (Satin and Mills, 1978). Information collected by health workers in five selected clinics,* using a standardised system, was used to explain the extent and result of the contact investigations. The earlier paper described the patient and contact populations that were the subjects of investigation. This paper describes and evaluates the activities of the health workers and the outcome of the contact investigations. It has been found that definition and measurement of success or effectiveness of contact tracing is complex. It will be demonstrated that most patients understand the importance of informing sex partners about the risk of infection, and do so, but the influence of the health worker on this exchange is impossible to determine. As before, differences in the findings between clinics are difficult to explain. As some information was found to be missing or inaccurately recorded, it was not possible to collect complete

data from each clinic; thus some of the totals do not correspond with those in the previous paper.

Method

The methods used to collect and assess the data have already been described (Satin and Mills, 1978)

Results and discussion

HEALTH WORKER RESPONSIBILITIES

Health workers in the five clinics participating in the study were expected to interview patients and visit contacts as part of their routine case finding activities and it is these activities that were recorded and compared.

Interviews

Of the total number of patients attending clinics only 15-25% are found to have gonorrhoea or syphilis; these should be interviewed by the health worker. It is the usual practice for the health worker to interview patients and record contact identifying and locating information only *after* diagnosis of gonorrhoea or syphilis has been made and treatment given. It is assumed that the contact tracing interview will help the patient to identify partners at risk so that their prompt attendance for examination and treatment may stop the spread of infection and onset of complications. Therefore it is important to record the time intervals between patient attendance,

*The clinics taking part were at University College Hospital, London (UCH); St Giles Hospital, London; Middlesex Hospital, London (JPH); St Thomas' Hospital, London (STH); Radcliffe Infirmary, Oxford.

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contact tracing interview, and contact attendance before investigating if and how these intervals can be shortened.

Table 1 shows the interval in days between the time at which patients first attended the clinic for medical investigation and the time when they were first interviewed by the health worker, by diagnosis.

Table 2 shows the same interval, but the patients are divided according to gender, and the number of patients interviewed is recorded as a cumulative percentage.

It can be seen that for a high proportion of all patients, treatment and the first interview with the health worker took place during the first attendance at the clinic. A longer interval between attendance and interview for those patients with syphilis may partly be attributed to delay in establishing a diagnosis. The higher proportion of men diagnosed and treated at first attendance was to be expected and was similar for all clinics. The St Giles clinic stands out as having the earliest completion of contact tracing interviews. This difference reflects a policy of interviewing and recording information about patients *before* they are diagnosed but when their contacts are known to be infected.

Reinterviews

Table 3 shows the percentage of patients who were interviewed by the health worker on only one occasion and those who were interviewed once, twice, or three times more.

With the exception of one clinic, there were fewer women than men reinterviewed. The policy at STH was to reinterview *all* patients who reattended, and this is reflected in the significantly higher percentage of patients reinterviewed. However, there may be several reasons why patients were not reinterviewed.

(1) They may not have reattended. (2) If at first interview diagnosis was deliberately withheld from the patient, conducting a reinterview might arouse suspicion. (3) The health worker may have asked to see that patient again but the referral not been made by the clinic staff. (4) If at first interview the health worker decided that there was nothing to be gained from seeing the patient again, then the health worker would not ask that the patient be referred. (5) There may not have been a health worker available to reinterview the patient.

Visits

Health workers visit contacts who otherwise would not be told that they needed medical care. Table 4 enables a comparison to be made between the total number of contacts named and contacts who were visited for this purpose.

The popular view that health workers spend much of their time visiting contacts is contradicted by these findings. Considering the small number of visits made by any health worker, the setting aside of a full day weekly for visiting seems difficult to justify. Rather, any necessary visit should be made with minimal delay.

CONTACT INVESTIGATION

Although for recording purposes the documents for contacts and patients are separate, it is the linkage and overlap which is a measure of successful contact investigation. Ideally, each individual involved in an infection will be (1) identified and recorded as a contact, (2) examined and treated for infection if necessary, and (3) identified by the health worker as having attended for investigation and, with patient status established, interviewed in turn for contacts.

Table 1 *Percentage of patients interviewed and their diagnoses, by number of days interviewed after attendance*

Clinic	Diagnosis of patient	Days						% for whom date not recorded or inaccurate	Total number
		Same	1-3	4-7	8-14	15-21	22+		
UCH	Gonorrhoea	63	5	9	6	1	2	14	258
	Syphilis/both infections	33	—	—	33*	—	34	—	12
St Giles	Gonorrhoea	95	1	3	1	1	—	—	195
	Syphilis/both infections	100	—	—	—	—	—	—	11
JPH	Gonorrhoea	76	2	10	6	1	3	2	341
	Syphilis/both infections	50*	—	7	5*	20	8	5*	40
Radcliffe	Gonorrhoea	76	3	11	3	2	2	—	109
	Syphilis/both infections	—	—	—	—	—	—	—	—
STH	Gonorrhoea	81	8	6	4	1	1	—	375
	Syphilis/both infections	50*	4	4	4	17*	21	—	24

*Includes those patients who were diagnosed as having both gonorrhoea and syphilis

Table 2 *Interval between attendance and interview, by gender of patient (cumulative percentage)*

Clinic	No. of patients	Percentage interviewed					
		Same day	Later (days)				
			1-3	4-7	8-14	15-31	22+
UCH	182 men	67	71	76	81*	—	—
	88 women	52	58	76	86	88*	—
St Giles	133 men	97	—	100	—	—	—
	76 women	92	93	97	98	99	100
JPH	295 men	78	79	85	91	95	98*
	96 women	60	61	79	87	88	94*
Radcliffe	59 men	92	93	100	—	—	—
	50 women	64	68	84	90	94	100
STH	255 men	90	93	95	98	99	100
	145 women	59	75	90	94	96	100

*Where percentages do not add up to 100%, data were not recorded or inaccurately recorded

Table 3 *Percentage of patients interviewed/reinterviewed*

Clinic	Gender of patients	Interviews				Total no. patients	Total no. interviews
		One	Two	Three	Four or more		
UCH	Men	91	8	1	—	182	200
	Women	100	—	—	—	88	88
St Giles	Men	69	19	10	2	133	192
	Women	70	26	4	—	76	102
JPH	Men	91	9	—	—	295	321
	Women	96	3	—	1	96	102
Radcliffe	Men	59	39	2	—	59	84
	Women	74	20	4	2	50	67
STH	Men	24	50	20	6	255	426
	Women	41	46	9	4	145	257

Table 4 *Total number of contacts named and contacts visited*

Clinic	Gender of contacts	Total no. of contacts		Total no. of visits made to contacts
		Named	Visited	
UCH	Male	212	—	—
	Female	186	1	1
	Not recorded	1	—	—
St Giles	Male	134	5	7
	Female	154	5	5
	Not recorded	21	—	—
JPH	Male	331	1	2
	Female	229	2	2
	Not recorded	4	—	—
Radcliffe	Male	110	1	1
	Female	98	8	8
	Not recorded	1	—	—
STH	Male	274	6	14
	Female	335	13	20
	Not recorded	2	—	—

The information recorded for such a located contact should include patient number, name of clinic, date of first attendance, and diagnosis.

The health worker takes the first step in this process at the first interview with a patient; assessment is made of the probability of bringing a contact

to examination, and what action the patient and/or health worker may initiate to achieve this. It was possible to deduce from the information recorded on the contact cards what assessment the health worker had made. The kinds of assessments made were categorised as follows:

Contact clearly untraceable

Contact believed to be already attending a clinic

Patient to inform contact

Patient probably unable to inform contact

Health worker to inform contact

Special contact report sent to DHSS/other clinic

Other, including contact named by someone other than patient; patient to try and inform contact through a third person; contact named, but involvement in infection questioned.

Table 5 shows how health workers assessed the possible outcome of contact investigation, related to the gender of the contacts. Few special contact reports were sent, so this category has been omitted.

These findings illustrate the difference that the gender of the contact made in this assessment. A higher proportion of men were thought to have attended a clinic before the patient was interviewed, and a higher proportion of women were yet to be informed by the patient naming them. This finding is not difficult to explain, given the differences in symptoms between men and women. The assessment of 'untraceable' and that of 'probably unable to inform' was made in a higher proportion of cases where the contact was a woman. The low proportion of contacts who were identified for 'health worker to inform' was surprising.

THE OUTCOME OF CONTACT INVESTIGATION

It was possible to code the outcome of contact tracing in one of four ways:

1. Contact known to have been examined;
2. Contact believed to have been examined;
3. Contact informed, but outcome unknown;
4. Contact not known to have been examined.

In category 1, proof of attendance was required—that is the name of clinic, patient number, and date of attendance recorded on the contact card. Category 2 was for those cases where there was reason to believe that contacts had attended a clinic or doctor for examination either privately or abroad. Although definite proof of attendance was lacking, there was a considerable degree of certainty attached, although it was not possible for a health worker to verify the information. Category 3 were those cases in which there was evidence that the contact had been informed of the need for examination, but the outcome was either not known or too uncertain to meet the criteria. Contacts were assigned to cate-

Table 5 Assessment of possible outcome of contact investigation, by gender of contact

Initial assessment	UCH		St Giles		JPH		Radcliffe		STH	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Untraceable (%)	13	19	6	16	12	21	5	10	7	7
Believed attending (%)	40	15	37	19	29	15	47	16	49	16
Patient to inform (%)	37	52	32	45	43	48	29	54	26	50
Patient probably unable to inform (%)	5	8	10	12	6	8	2	6	4	13
Health worker to inform (%)	1	2	2	2	3	3	10	4	6	4
Other (%)	—	3	2	4	1	2	3	5	2	7
Unrecorded (%)	5	2	12	2	5	3	4	1	4	3

gory 4 when there was no evidence to suggest that they had been informed or examined. It was not possible to assess how many of these contacts, or indeed those in category 3, actually and ultimately did attend for examination.

Table 6 shows the percentage and gender of contacts assigned to each outcome category. It can be seen from Table 6 that more than half of the male contacts, in all clinics, were known to have been

examined. The highest figure (64%) was for male contacts of patients attending the Radcliffe clinic. About half of the female contacts were known to have been examined; the highest figure of 58% was also obtained at the Radcliffe. Not surprisingly, more female than male contacts were *not* known to have been examined. This is true for all the clinics.

Table 7 compares the assessment made at first interview with the recorded outcome of contact

Table 6 Outcome of contact tracing related to gender of contact

Clinic	Gender of contact	Category				Total no. of contacts
		1. Contact known to have been examined (%)	2. Contact believed to have been examined (%)	3. Contact informed, outcome unknown (%)	4. Contact not known to have been examined (%)	
UCH	Male	53	4	4	39	212
	Female	50	—	2	48	186
	Not recorded	—	—	—	—	1
St Giles	Male	59	11	5	25	131
	Female	45	7	1	47	154
	Not recorded	24	—	5	71	21
JPH	Male	51	22	4	23	331
	Female	47	12	6	35	229
	Not recorded	—	—	—	—	4
Radcliffe	Male	64	8	4	24	110
	Female	58	—	11	35	97
	Not recorded	—	—	—	—	1
STH	Male	56	11	10	23	274
	Female	50	4	4	42	335
	Not recorded	—	—	—	—	2

Table 7 Assessment compared to outcome

Clinic	Outcome	Believed already attending	Patient to inform	Patient unable to inform	Health worker to inform	Untraceable	Total no. of contacts
UCH	Definitely examined	101	92	—	—	—	193
	Believed examined	9	1	—	2	—	12
	Not known examined	2	81	26	3	63	175
St Giles	Definitely examined	62	69	—	2	2	135
	Believed examined	15	8	—	—	—	23
	Not known examined	2	40	35	4	40	121
JPH	Definitely examined	94	152	4	14	1	265
	Believed examined	36	53	3	—	—	92
	Not known examined	1	49	30	2	90	172
Radcliffe	Definitely examined	64	48	—	9	—	121
	Believed examined	3	5	—	1	—	9
	Not known examined	1	31	8	5	17	62
STH	Definitely examined	152	134	2	16	—	304
	Believed examined	27	11	2	1	—	41
	Not known examined	9	94	50	13	42	208

investigation. The categories of assessment which were seldom used have been omitted from this comparison.

Health workers were able to establish in most cases a definite date and place of examination for a contact thought to be already attending a clinic or doctor. An outcome of 'definitely examined' was found for slightly more than half of those contacts in the category 'patient to inform'. Three of the 253 contacts assessed as untraceable were subsequently recorded as examined.

Table 8 shows whether contacts attended before, after, or on the same day as the patient naming them. Some records which were left incomplete were classified as 'no interval recorded'.

The sex difference is noticeable; with the exception of JPH, over half of the men named as contacts had attended *before* the patients naming them. More than half of the women attended *after* the patients naming them. The relative proportion of contacts attending on the same day as the patients naming them was similar for the four London clinics. The Radcliffe figures differ sharply, reflecting the fact that clinic sessions for men and women were held on alternate days.

Table 9 shows where contacts attended for medical examination. The 'other clinic' category includes clinics in and outside London, and in and outside the UK. Contacts included in the 'other/not applicable' category did not attend clinics but consulted GPs, private doctors, or other hospital doctors.

For all contacts known to have been examined, the majority attended the same clinic as the patient who named them. Fewer male contacts attending the same clinic as the patient naming them were recorded at JPH than in any of the other clinics. There is no explanation for this finding. The comparatively high percentage of male contacts of Radcliffe patients who were not treated in a clinic

Table 8 *Percentage of contacts who attended before, on same day, or after patient attended*

Clinic	Gender of contact	% of contacts attending			% for whom no interval recorded	Total no. of contacts
		Before	Same day	After		
UCH	Male	59	18	17	6	108
	Female	24	21	53	2	85
St Giles	Male	54	13	27	6	83
	Female	16	20	54	10	76
JPH	Male	24	10	34	32	210
	Female	12	13	50	25	121
Radcliffe	Male	54	4	30	12	77
	Female	19	4	74	3	57
STH	Male	52	15	20	13	172
	Female	16	18	56	10	175

Table 9 *Place of examination of contacts*

Clinic where patient attended	Place of examination of contacts	Male contacts		Female contacts	
		(%)	(no.)	(%)	(no.)
UCH	Same clinic	72		72	
	Other clinic	22		28	
	Other/not applicable	4*		—	
St Giles	Same clinic	79	120	74	94
	Other clinic	13		17	
	Other/not applicable	8		9	
JPH	Same clinic	53		66	
	Other clinic	33		22	
	Other/not applicable	11		12	
Radcliffe	Same clinic	75	230	83	123
	Other clinic	5		12	
	Other/not applicable	20		5	
STH	Same clinic	70	79	67	58
	Other clinic	18		28	
	Other/not applicable	11*		4*	
			176		175

*In instances where percentages do not add up to 100%, data on place of examination were not recorded.

may reflect the fact that there is only one clinic in the locality although a proportion may have been examined at the local USAAF base. However this pattern was not found among the female contacts of Radcliffe patients.

Ninety-three per cent of patients interviewed during the study period had gonorrhoea, and Table 10 summarises the diagnoses of their contacts. All those contacts known or believed diagnosed are included in this table. The category 'diagnosis questioned' was used when the diagnosis was in doubt.

It can be seen that, with the exception of the Radcliffe, more female than male contacts had gonorrhoea. About 70% of male contacts had gonorrhoea and this figure was nearly 75% for females. Only a small percentage was found not to have any infection at all. Differences between males and females and between clinics may reflect differences in (1) clinic policies, (2) laboratory facilities, (3) health worker decisions about which sexual partners are involved in a given infection, or (4) they may indicate a real sex difference in infectivity, or any combination of these factors.

Conclusions

1. Many patients were willing and able to give reliable information to the health worker about contacts:

- (i) in those instances where contacts were believed to be already attending a clinic, the health workers were able to establish an outcome of 'known to have been examined' for at least

Table 10 *Diagnosis of contacts of patients with gonorrhoea*

Clinic	Gender of contact	Percentage known or believed to have			Percentage with diagnosis		No. of contacts known/believed diagnosed
		Same infection as patient	Different infection from patient	No infection	Questioned	Not recorded	
UCH	Male	75	6	12	6	1	121
	Female	88	6	5	1	—	82
St Giles	Male	71	3	8	16	2	84
	Female	81	4	3	12	—	67
JPH	Male	57	4	3	19	17	207
	Female	65	3	5	13	14	101
Radcliffe	Male	70	8	16	6	—	64
	Female	72	14	8	4	2	72
STH	Male	71	15	6	5	3	187
	Female	81	7	7	1	4	134

70% of contacts in all clinics and 94% in one.

- (ii) in those instances where the patient had agreed to inform the contact, between 50% and 60% of contacts were subsequently known to have been examined.

The implication of these findings is that most patients *do* understand the responsibility of informing sex partners about the risk of infection and do so. The indirect influence of the health worker on this transaction is impossible to determine. Only in those few cases where it is left to the health worker to inform a known contact at risk is it possible to determine if direct action is successful.

2. More men than women were interviewed by the health worker on the day that they first attended the clinic, as more men are diagnosed and treated on their first attendance.

3. Much of the health worker's time is spent in verifying the information given about contacts. Some health workers think that their time is wasted on 'unnecessary' clerical work, but the administrative aspect of the health worker's job is an integral part of it and is essential to measure effectiveness. The reinterview is an opportunity for the health worker to:

- (i) discover how effective the patient has been in locating and informing his contacts
 - (ii) determine what further action may need to be taken by the patient or directly by the health worker. Great variation was found in clinic practice regarding reinterview and it is recommended that health workers routinely try to interview patients on at least one subsequent clinic visit as it is the most efficient way to determine outcome.
4. As with the patient population, differences were observed between men and women in the contact population.

- (i) At first interview, female contacts were more often assessed as untraceable than male contacts. Fewer women than men were thought

to be already attending a clinic. A higher proportion of women were to be informed by the patient naming them and the assessment of 'patient probably unable to inform' was made far more often when the contact was a women.

- (ii) Male contacts were more often known to have been examined and believed to have been examined than female contacts. More than half of the male contacts, in all clinics, were known to have been examined, compared with rather less than half of the female contacts.

- (iii) Most male contacts attended before or on the same day as the patient who named them. This highlights again the fact that males with urethral gonorrhoea are likely to have symptoms which trigger attendance, whereas women attend in response to having been told of a partner's symptoms or confirmed infection.

5. Two-thirds or more of those contacts who were examined attended the same clinic as the patient who named them. This finding should reassure health workers that it is possible to complete much contact investigation within one clinic.

6. At least 85% of those contacts who were examined were found to have a treatable condition. At least 67% had the same infection as the partner who named them. A slightly higher percentage of female contacts than male contacts (with the exception of the Radcliffe) were found to have the same infection as their partners.

The concept of success or effectiveness of contact tracing is complex in definition and measurement. It is not surprising that health workers have difficulty in determining the success of their efforts. Until now they have not been in a position to examine how they might work more effectively. It is suggested that the job satisfaction and status of health workers in special clinics depend on the acceptance of a

system that, using care in both definition and recording, gives a measurable standard of effectiveness.

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