NOTES ON THE EPIDEMIC OF 'ASIATIC' INFLUENZA ON THE MINES, JULY—AUGUST, 1957

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Now that the influenza epidemic which had swept like a veld fire through the Native compounds of the mining industry has spent itself and all mine hospitals report almost normal conditions, one may well consider the epidemic in retrospect and review the steps which had been taken to cope with the emergency. Furthermore, the lessons learnt from this epidemic may be very useful should further waves of the epidemic recur.

Although approximately 350,000 Native labourers are employed in the gold mining industry, this present review is based on figures from the labour complement of the gold mines of the Central Mining-Rand Mines Group only—altogether 83,467 during July 1957.

The Native Labour Force. This labour force is housed in large compounds, accommodating from 3,000 to 5,000 Natives each. The inmates sleep in dormitories with a capacity of from 16 to 20 in the newer compounds and larger numbers in the older ones. By Government Regulation a minimum of 200 c. ft. room space is allowed for each occupant. The inmates of the compounds are constantly coming and going. The annual labour turnover is almost 100% and these voluntary labourers come from all parts of the Union of South Africa, the British Protectorates of Bechuanaland, Swaziland and Basutoland, and surrounding territories as far north as Tanganyika. It will be appreciated that under these conditions a compound could be expected to be severely affected by an outbreak of influenza.

ANTICIPATORY ACTION

When, therefore, it became known that the influenza epidemic which had started in the East had assumed the proportions of a pandemic and was spreading throughout most of the world, it needed but little deduction to know that, should it come to South Africa, the mines would undoubtedly be heavily affected. Following out this line of thought, it was imperative that steps for coping with the large numbers of sick labourers should be made well in advance. In addition, it was considered that the non-medical officials on the mines should be informed of what might happen. This would serve the double purpose of allaying unnecessary fears which were being engendered by newspaper headlines, and preparing compound officials for what would be expected of them. Forewarned is forearmed—and how true this proved to be!

After a staff meeting of senior medical officers of the Group at which the problem was discussed, the following memorandum was circulated to all mine managers of the Group on 21 June 1957:

'Many rumours and reports have reached this country about the influenza epidemic which is raging in the East, and one is perturbed by the thought that should the disease spread here, large numbers of mine labourers may become incapacitated.

'The reports reaching South Africa seem to carry a disproportionately high news value and have awakened memories of the 1918-1919 epidemics in many people. However, certain facts emerge from these reports which deserve consideration.

'There is no doubt that very large numbers of people are affected. On the other hand, the mortality is negligible. The epidemic may, therefore, be considered as of a benign nature, although highly infectious and spreading rapidly. The incubation period is 2-3 days, and most persons are ill for about 1 week.

'Authorities on world health agree that very little can be done to curb the spread of the disease, so the possibility is not remote that it may well spread to this country.

'One does not wish to partake in encouraging any mass hysteria of a fear for something which may never come to pass, but it is felt that senior officials should be fully aware of measures which may have to be instituted at short notice to reduce the disruption of the labour force to a minimum.

'On the mines we have the advantage of an efficient health set-up which should be able to handle the medical treatment during an epidemic. We have, however, this disadvantage that our labour force, working and living in restricted areas, may be very susceptible to a rapid spread of influenza, and that hospital accommodation might not be adequate.

'A vaccine is being produced in this country. Unfortunately it is expected that enough will only be available for key personnel. The obvious safeguard of mass-immunization is therefore out of the question.

'If an epidemic threatens, the following, in broad outline, would be the steps taken:

(*a*) Personnel would be vaccinated on the basis of available vaccine. Arrangements for the supply of vaccine will be made by this Department in collaboration with the Union Health Department.

(*b*) All Native labourers complaining of feeling ill should be sent to surface as soon as possible.

(*c*) If no more beds in mine hospitals are available, hospitalization should be reserved for those influenza cases with complications, and the others treated in compounds.

(*d*) It would be advisable to reserve a certain area of a compound as an emergency hospital.

(*e*) Compound staff would have to arrange for (i) An organization to deliver food to the patients in their rooms, and (ii) sanitary buckets with suitable screens close to every room. These would have to be changed daily.

(*f*) The Resident Medical Officer will make arrangements for his staff to nurse and treat the patients kept in compounds.

(*g*) An adequate supply of drugs which might be required is being stock-piled by the Central Medicine Company. It will not be necessary at this stage for individual hospitals to increase their stocks.

(*h*) This department will have to be informed daily of all new cases having occurred in the previous 24 hours.

'One wishes again to emphasize that this possible emergency is one which holds no great threat to life and orders or discussions with non-medical staff should stress this. There is absolutely no need to spread the idea that we are faced with anything akin to the previous influenza epidemic. In any case, most of the deaths then were due to pulmonary complications which can today be treated adequately.

'Further circulars in this regard will be issued if and when required.'

It is common knowledge that the usual steps, apart from vaccination, to curb the spread of influenza have hitherto proved singularly ineffective. Hence no precautions were taken in this regard except that it was hoped to isolate the frankly ill.

THE COURSE OF THE OUTBREAK

At the beginning of July, 1957 one or two mines—not of this Group—were said to have noticed a sudden increase in Natives reporting ill with influenza-like symptoms.

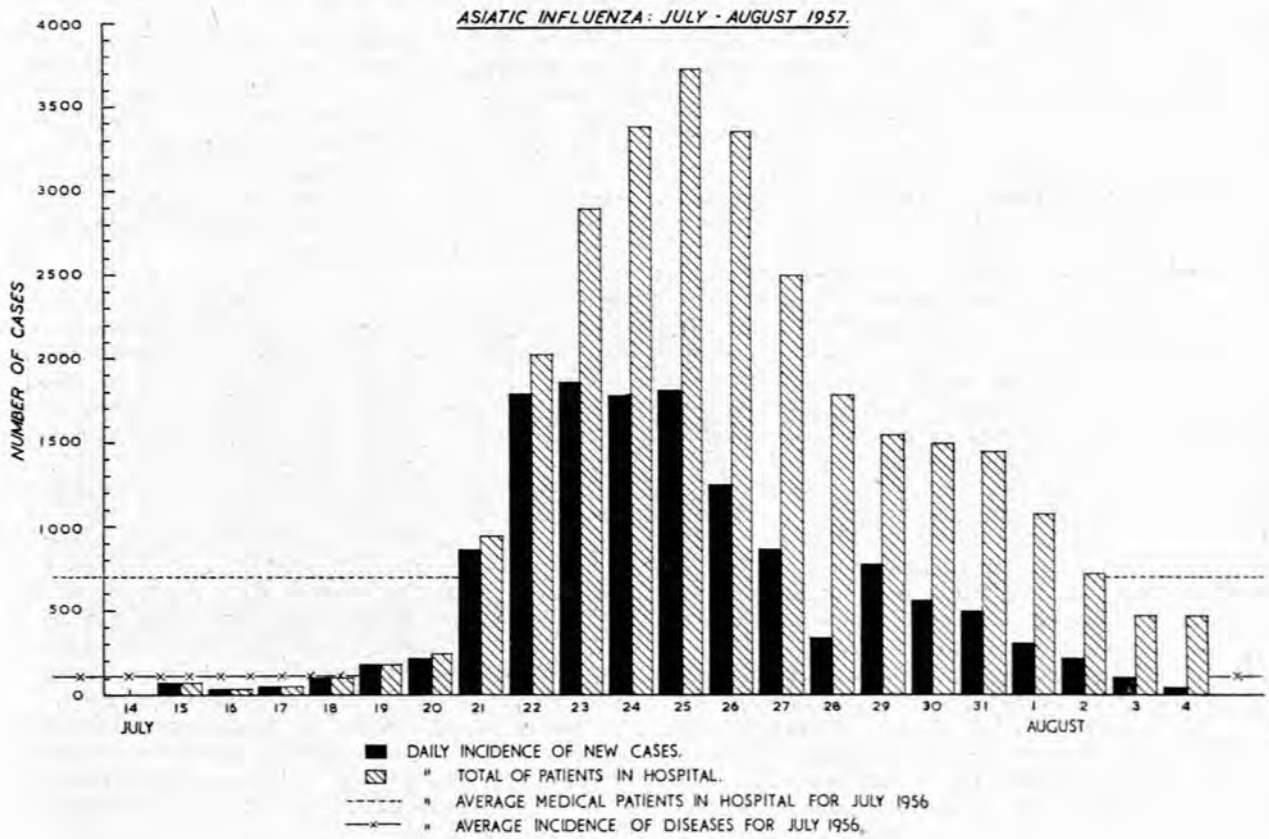
In our Group cases were first admitted from 15 July at City Deep, a mine situated near Johannesburg. On 18 July it started on East Rand Proprietary Mines, this time near Boksburg, and on the next day at Harmony Gold Mining Company at Virginia in the Orange Free State.

By 22 July, i.e. 1 week after the disease had made its appearance on the first of our mines, it had 7 large mines along the Witwatersrand and 1 in the Orange Free State in its grip, 1,789 new cases being reported and 2,015 already in hospital on that day. During the course of the next 3 days it appeared at 3 mines in the Witbank Coal Fields. Although statistics for the first 3 or 4 days are slightly inaccurate, the histogram in Fig. 1 shows the sudden rise in men reporting sick as compared with the normal average for July.

As was anticipated, when cases started being admitted all hospitals were quickly filled up. Special mention must be made of the enthusiastic assistance which mine managers and compound officials rendered towards establishing emergency accommodation along the lines set out in the circular.

Compound rooms were cleared out and cleaned. At first the expected requirements were impossible to assess

FIGURE 1—



but, nevertheless, at no mine did we lack accommodation —the cleaning out and preparation of additional rooms always having remained safely ahead of each day's new crop of patients. When we ran out of bedding, emergency mattresses were made by stuffing jute bags with straw, and patients were asked to bring their own blankets.

Lavatory facilities were established outside all rooms. These mostly consisted of sanitary buckets screened off by suitable material. At one mine, where an underground sewer line passed in front of the rooms, a temporary water-borne system was laid on which worked very well.

The details of medical attention were organized by each senior resident medical officer, having regard to the specific conditions pertaining on his particular mine. In general, after the first rush and excitement had subsided, the routine was as follows:

All Natives reporting sick were detained at the compound emergency hospitals, where a medical officer did a round twice daily. Serious cases were sorted out and referred to the mine hospital, while the milder cases were detained in the emergency hospital. Here an experienced medical orderly or nurse took temperatures twice daily and noted, as far as was practicable, any patients who needed more specialized attention. The issue of palliative medicines, mostly salicylates and cough mixtures, was also supervized by this person.

At 2 hospitals in the Group 5th year medical students were temporarily employed. Their main duty was to assist in sorting out the serious cases for the medical officer's more detailed examination, and they spent most of their time at the emergency compound hospitals. These men proved most useful and, apart from the experience they gained, they did an excellent job of work in preventing patients ill with some other fulminating disease, e.g. meningitis, being missed in the rush and not receiving skilled attention for a few hours, which may have meant the difference between life and death. This is an ever-present danger in any epidemic where large numbers of mild cases have to be treated.

Convalescence

As regards convalescence, the usual routine of giving discharged patients a period of light surface work where deemed necessary had to be altered, owing to the large numbers involved. In most cases an extra day's convalescence in the compound proved quite adequate. From the point of view of the possibility of heat stroke in the hotter mines, the large numbers who were ill caused much concern. On the so-called 'hot mines' all Natives are acclimatized for a period of 14 days under very strict supervision in special stopes. Normally any man having been in hospital more than 5 days is re-acclimatized before returning to his normal work. It was soon realized that the acclimatization centres might be over-burdened during the epidemic. It was therefore decided that for the duration of the epidemic only those Natives who were employed on heavy tasks, and who had been away from their underground work for 5 days or more as a result of influenza, or whom the mine medical officer had considered to have had a serious attack, should be re-acclimatized before returning to their normal occupation.

In addition, the attention of underground labour supervisors was repeatedly drawn to the need for keeping a sharp look-out for anyone feeling ill. These precautions worked so well that one is pleased to mention that no case of heat stroke was recorded in this Group during the epidemic.

LABORATORY DIAGNOSIS

Early in the epidemic throat washings were collected and forwarded to the South African Institute for Medical Research for isolation of influenza virus. Unfortunately the various processes required for the isolation of the virus normally take so much time that the epidemic was on the wane before the findings became known. With present-day methods great achievements have been reached in the isolation of viruses, but more rapid means of isolation should be one subject of future research. From an epidemiological point of view it is but faint comfort to have the clinical diagnosis verified after the epidemic has run its course.

CLINICAL OBSERVATIONS

Although the disease ran fairly true to form, as could be judged from such scanty literature as was available at the time, the following impressions gained by one of us (A.O.D.) at the City Deep Central Native Hospital may well be of interest.

On Monday, 15 July amongst the medical admissions to the hospital there were about 10 patients who complained of severe headache and general muscular pains associated with pyrexia. Clinical examination proved negative. These are the usual features of ordinary influenza and this disease is very prevalent amongst our mine Natives at this time of the year.

However, suspicion was aroused as to the possibility of Asiatic influenza because of the very high temperatures (102°—104°F) associated with a normal pulse rate. Although the patients were considerably distressed there appeared to be no clinical evidence of a corresponding constitutional disturbance.

By the end of the week this peculiar type of influenza, since confirmed as Asiatic influenza from the throat washings of some of the patients, had spread with explosive rapidity and resulted in over 2,321 Natives (20·7% of total complement) reporting sick in a matter of a fortnight.

For descriptive purposes this illness can be roughly divided into 3 main groups, namely the very mild group, the moderately severe group, and the group comprising the patients who were comparatively severely ill.

Group I—The Mild Group

About 55% of the total number of patients who reported sick belonged to this group. The main symptoms were headache, generalized pains in the limbs, lumbar back pain and, occasionally, retrosternal pain. The temperature was normal or raised to less than 100°F, the pulse rate normal, and clinical examination negative.

These cases were detained in hospital, or in the emergency sick bays established in the mine compounds, for a day or two, after which period the Natives themselves volunteered the information that they were now perfectly well and wished to return to their normal underground work. Apart from the few whose temperatures had not completely subsided or whose symptoms had not yet abated, the remainder were allowed to resume normal work. The treatment consisted of a salicylate mixture administered twice a day.

One cannot help feeling that in this group are included many patients who, although they complained of headache and so on, were not really ill. During the explosive stage of the epidemic it is quite possible that many Natives reported

sick in the hope that our medicine had some prophylactic value, or possibly also felt the need of the reassurance of a medical examination.

Very few of these cases returned subsequently for further treatment or with a genuine attack of the disease.

Group II—The Moderately Ill Group

Approximately 40% of the total number of Natives who reported sick can be described as having been moderately ill.

The symptoms were more or less the same as for Group I, except that retrosternal pain was more frequently present. Many suffered from tonsillitis, pharyngitis, laryngitis or tracheitis, sometimes associated with a dry unproductive cough or perhaps hoarseness; a few had conjunctivitis and a few mild otitis media. A fair number had definite rigors at the commencement of the attack. Practically all of them had high temperatures and normal pulse rates, but no clinical signs of lung involvement.

The temperatures usually returned to normal within a day or two, and this fall in temperature was usually accompanied by a most striking cheerfulness (almost euphoric) in the patients' general outlook—a complete change from the distress of the previous day or two. Nearly all of them said they were now fit enough to return to their normal underground work and were keen to do so. This observation was in distinct contrast to the ordinary influenza recovery, where the patient is usually left rather debilitated, disinterested and somewhat depressed and usually requiring a few days of convalescent work before being returned to normal underground work.

The cases from this group were treated either in the convalescent wards of the hospital or in the compound emergency sick bays. The only drug treatment employed was salicylates, and nearly all patients were returned to normal within 4 to 5 days.

Group III—The Comparatively Severely Ill Group

This group accounted for approximately 5% of the total. The symptomatology was the same but apart from the usual distress the patients showed definite evidence of constitutional disturbance by having an accelerated pulse rate, even if apyrexial. In some, clinically diagnosable bronchitis was present; in others, a severe laryngo-tracheitis. None showed any signs of encephalitis although one patient was lumbar punctured, as a diagnostic precaution, for meningeal irritation.

Although this group is classified as severe, none could be compared in severity with that of the acute fulminating type of ordinary influenza, which is not infrequently encountered in our mine Natives. At no time was there any anxiety as regards possible mortality in this new type of the disease.

Patients in this group generally took longer to regain a normal temperature and were usually left somewhat debilitated at the end of the attack.

It was also in this group that were most frequently found the patients who were apyrexial on admission, but had rapid pulse rates, and who later developed their pyrexia.

At times it was impossible to distinguish a severe case of Asiatic influenza from an attack of moderate severity of the ordinary type. It is probable, therefore, that cases of ordinary influenza have been included in this group.

Treatment consisted of hospitalization with adequate nursing facilities. The drugs employed were primarily the salicylates supplemented with sulphonamides or penicillin as considered necessary. In only one case was aureomycin or other broad-spectrum antibiotic used. The drugs were given for their possible prophylactic value in limiting the spread of lung involvement. It is not possible to assess the value of these in either influencing the course of the disease or its severity. Hospitalization varied from about 5 to 7 days and was followed by a few days of light surface convalescent work before resuming normal work.

Relapse Rate

The percentage of cases readmitted to hospital after a lapse of 3 to 7 days after discharge was 1·4.

Reviewing, it will be obvious that many cases included in Group I were probably never cases of Asiatic influenza and that others probably suffered from an abortive type of the disease. Similarly, Group III probably includes many cases of ordinary influenza, especially in view of its high incidence at this time of the year. Group II probably reflects a truer incidence of the disease as well as the truer clinical picture. Without the assistance of laboratory tests, an accurate incidence of the disease is impossible to assess.

Hospital Staff

It has been said that it requires an emergency to bring the best out of a man. The influenza epidemic certainly brought the best out of our hospital staffs, considering the way in which they rose to the occasion. Everyone took it for granted that he or she had to do three or four times the normal quota of work. It was remarkable how difficult it was to persuade a staff member with a mild attack of the disease to go home and rest. Unfortunately the epidemic did not spare those people who so ably and gamely wrestled with it. Table I shows the incidence amongst the staff.

TABLE I

Hospital staff	*No. employed*	*No. ill*
Medical officers	20	4
European nurses—male	41	3
European nurses—female	12	2
Native nurses—female	123	6
Unqualified Native male orderlies	186	21
Total	382	36

GENERAL OBSERVATIONS

The epidemic swept through the mines with remarkable rapidity, affecting a total of 16% of the labourers to the extent of causing the men to miss working shifts, almost wholly within the course of 2½ weeks.

Although conditions controlling the spread of respiratory infections were more or less similar on all mines, the percentage incidence for different mines varied considerably (Table II). The explanation of this phenomenon, although noticed in all previous influenza epidemics, has still to come forward. Although the severity of any disease is often a matter of opinion varying much from observer to observer, senior medical officers of the mines were asked to grade the patients into 3 categories. These estimates are also shown in Table II.

During an epidemic of this nature doctors are inclined to notice certain common or uncommon features of the disease. The facilities for controlling these observations by strict

TABLE II. INFLUENZA CASES FROM 15 JULY TO 4 AUGUST 1957

Mine	Average No. Employed	No. of Cases	Percentage of Complement	Nature of Disease		
				Mild %	Medium %	Severe %
Blyvooruitzicht	7,373	1,120	15·2	40	50	10
City Deep	11,504	2,714	23·6	55	40	5
Consolidated Main Reef	9,643	842	8·7	67	32	Less than 1
Crown Mines	14,975	1,622	10·8	89	10	Less than 1
Durban Roodepoort Deep	9,544	1,730	18·1	87	8	5
East Rand Proprietary Mines and Rose Deep	16,804	2,437	14·5	70	25	5
Harmony (OFS)	5,658	1,277	22·6	95	3	2
Modderfontein East and Modderfontein B	5,587	991	17·7	10	87	3
Witbank and Van Dyks Drift Collieries	1,774 605	616	25·9	65	29	6
Total	83,467	13,349	16·0			

statistical methods rarely exist—but, then, most of the syndromes described by our early predecessors were the result of careful bedside observations devoid of statistical control but proved by time. For this reason the following points are mentioned in passing:

Several medical officers laid great stress on the appearance of the pharynx, which in most well-developed cases showed a red to purplish velvety colouration of the posterior wall, extending to the soft palate and associated with a mild oedema of the uvula and the surrounding area.

The acute form of the disease seen in the epidemic following World War I rarely if ever occurred, although the following case from Harmony Gold Mining Company is worth mentioning: 'A boy collapsed in the compound and was brought in semi-comatose, with marked cyanosis and with almost heliotrope colouration of the fauces. He was pulseless and collapsed, but responded dramatically to ACTH. After 24 hours of routine influenza treatment he was considered fit, but was kept longer for observation.'[1]

The following observation from Crown Mines is interesting: 'Temperatures on admission were reasonably in proportion to the degree of illness, but not so on the second and third day when temperature had little bearing on severity. In fact, speaking generally, the height of the temperature was not a good indication of the severity of the illness.'[2]

Mortality

One death, occurring on 29 July at Durban Roodepoort Deep, might possibly be ascribed to influenza. The patient was admitted in a serious condition with signs of acute respiratory involvement and died 2 hours later, notwithstanding vigorous treatment. The post-mortem was conducted by Dr. L. E. Miller, who had experience of the 1918 pandemic. The lungs showed early broncho-pneumonia conforming to the influenzal type. Laboratory specimens were taken but no virus was isolated.

Disruption of Labour

The epidemic was responsible for the loss of roughly 35,000 working shifts over and above the normal degree of absenteeism. Total shifts lost because of disease was approximately 3 times the usual monthly average.

On the face of it one would have expected considerable disruption of gold production. The actual loss of production was, in fact, very slight. This can be explained in two ways: Firstly by the fact that on the average men only stayed off work for a few days at a time. During this period those remaining behind maintained the work rates of their respective gangs by each doing a little more work than usual. Secondly, it is probable that managements, where possible, suspended less urgent work and concentrated what labour force was available on essential work only. It is obvious that both these factors can be expected only to operate for short periods at a time, and that a normal production rate would be impossible to maintain for any great length of time under such adverse conditions.

Table III shows comparative labour statistics for June and July 1957. If it be assumed that the other conditions on the mines did not change very significantly during the two months, the difference in shifts lost could be roughly ascribed to the epidemic. It must be remembered, of course, that the epidemic extended into the first few days of August although it was then rapidly dying out. Table III is therefore not a complete reflection of the conditions, but it does show the trend.

TABLE III

	June 1957	*July* 1957
Total possible working shifts	2,216,682	2,253,609
Shifts lost through disease	17,510	53,228
Percentage of shifts lost	0·79	2·36

To sum up: The disease was mild, without serious complications and with negligible mortality. It never at any time presented any major medical problem, unless one includes the provision of emergency accommodation. The patients, however, suffered considerable distress and discomfort for a day or two. To the mining industry it meant the loss of many working shifts, together with the disorganisation that goes with it.

SUMMARY

These notes describe the steps which had been taken to cope with the epidemic of so-called Eastern or Asiatic influenza on the mines of the Central Mining-Rand Mines Group during July-August 1957. The clinical course of the disease ran true to elsewhere reported form. Statistics showing the effect on the Native labour force are quoted.

OPSOMMING

Die stappe wat gedoen is om die epidemie van sogenoemde Oosterse of Asiatiese Griep van Julie-Augustus, 1957 op die myne van die Central Mining-Rand Mines Groep die

hoof te bied, word beskryf. Die kliniese voorkoms van die siekte het nie veel afgewyk van beskikbare beskrywings nie. Die uitwerking van die epidemie op die naturelle-arbeidsmag word statisties aangetoon.

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