

Assessment of Care in the Neonatal Units  
of Luxor and Aswan

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## INTRODUCTION

For a period of 4 months during the summer of 1998 the care delivered by the neonatal units of Luxor Hospital and Aswan Teaching Hospital was assessed. The assessment consisted of two distinct, but integrated types of data collection.

1) PATIENT SPECIFIC DATA Throughout the four month study period data was collected on all children who came to the unit--both those admitted and those who came seeking admission, but were not admitted for whatever reason. If a child was admitted, questionnaires for the admission, for each day the child remained in the unit and for discharge were completed. In addition a questionnaire was administered to the person who brought the child and to the mother of the child. Finally a visit was made to the home of the child one week after discharge for all children discharged alive.

2) UNIT SPECIFIC OBSERVATIONS During the final month of work in the neonatal units, observations were made of all the work in the units. An observer was present in the unit throughout all 24 hours of the day recording all visits to the unit by doctors, nurses, and any other persons and recording all actions taken within the unit.

In combination these two forms of data provide a very detailed picture of the care delivered by the units.

The following report will present some of the basic results from the monitoring of admissions to the unit, and some notes on the observations that were conducted. These data are preliminary, and should be used with caution. While it is likely that the general conclusions drawn will stand after the data have been completely processed and checked, exact levels of some indicators may vary substantially when the final data are available.

## CHARACTERISTICS OF ADMITTED NEONATES AND THEIR PARENTS

For all children who were admitted a questionnaire was completed with the doctor or nurse responsible for the child. This questionnaire recorded basic information on when the child was admitted, gestational age at birth, who admitted the child, weight on admission, symptoms and diagnosis, what tests were done for the child in the period immediately following admission, what medicines were prescribed, other information on treatment such as intravenous fluids and assistance with breathing, and breastfeeding status. A separate questionnaire was used with the person who brought the child to the unit. This questionnaire included information on who brought the child, where the child was born, who attended the birth, age and education of the parents, where the child came from, and a range of questions about prior treatment, if any, the symptoms noticed, what was being done for the child at the unit, and how much the child's treatment cost.

About 20 percent of the admitted neonates come within an hour of birth, but at least 40 percent come 2 days or more after birth. The former were necessarily delivered in the hospital and brought immediately from the delivery room--often by a nurse or doctor. The latter were either born at home or at some outside clinic and health facility and had generally spent some time at home before coming to the unit. Forty-four percent of the children were born at a government hospital, and 39 percent at a private hospital or clinic. Just 14 percent were born at home--either their family home, or another home. Thus the neonates admitted to these units appear to be quite different from a normal group of newborns. A study of two Egyptian governorates found that 74 percent of babies were born at home, and in Upper Egypt the percentage is likely to be somewhat higher. Another indication of the difference between the

children admitted to the neonatal unit and the general population is that the births of 78 percent of admitted children had been attended by a doctor. In the two governorate study mentioned above traditional birth attendants (dayas) were responsible for more than 50 percent of deliveries while physicians were responsible in just 30 percent of the cases. Moreover, fully 92 percent of the admitted children were referred to the unit by a physician. Thus, many of the children who were not delivered by a physician went to a physician before coming to the unit. In part, this high use of physicians by women whose children are admitted to the unit may reflect the fact that these mothers had anticipated problems (perhaps because of prenatal care) and therefore disproportionately chosen to deliver at a hospital or with a doctor in attendance. We will consider this question further in subsequent analysis.

The mothers of these children are mostly in their 20s and early 30s. Just 6 percent are less than 20 years of age (the youngest being 16) and just 22 percent 35 years of age or older (the oldest being 43). The parents are, on average, much better educated than new parents as a whole. Just 19 percent of fathers and 20 percent of mothers have never studied, while 52 percent of both fathers and mothers have at least some secondary education.

A high percentage of the children admitted to the units are premature and of low birth weight (Tables 1 and 2). Overall, about 18 percent of children admitted to the units were born before 32 weeks gestation while fully 52 percent weighed less than 2500 grams. In general, the children admitted to the Luxor unit were more likely to be premature but the admission weight didn't differ significantly by unit.

Surprisingly, even at discharge a large proportion of the children still weigh very little (Table 3). Only a small proportion are very low weight (below 1500 grams), perhaps because

many of the admitted children in this weight group died. Nevertheless, a strikingly high proportion are between 1500 and 2400 grams--fully 52 percent of all discharged children in Luxor fall in this group. Another way of seeing this is that the mean weight of children discharged

Table 1 Estimated Gestational Age of Admitted Neonates by Unit

Gestational Age	Luxor	Aswan
<= 27 Weeks	1.2	1.3
28 - 31 Weeks	19.5	13.0
32 - 35 Weeks	13.4	10.4
36+ Weeks	65.9	75.3
N	82	77

Table 2 Estimated Admission Weight of Admitted Neonates by Unit

Weight	Luxor	Aswan
<1500 Grams	15.5	14.3
1500-2400 Grams	36.9	37.7
2500-3900 Grams	44.0	45.5
4000+ Grams	3.6	2.6
N	84	77

Table 3 Estimated Discharge Weight of Admitted Neonates by Unit Discharged Alive ONLY

Weight	Luxor	Aswan
<1500 Grams	3.2	5.5
1500-2400 Grams	51.6	32.7
2500-3900 Grams	40.3	60.0
4000+ Grams	4.8	1.8
N	62	55

alive is only slightly higher than the mean weight of all children admitted--180 grams higher in Luxor and just 30 grams higher in Aswan. This seeming failure of the admitted children to gain weight in the unit is also reflected in the response to the question of whether children discharged alive had gained weight in the day before their discharge. Only 43 percent were reported to have done so in Luxor, and just 18 percent in Aswan. In the future we will examine weight gain (or not) in more detail specific for each child. It is quite possible that even much of the apparent weight gain is caused more by the death of low-weight children than by increases in the weight of survivors.

Many of the children stay in the units for relatively short periods of time--particularly in Aswan (Table 4). The longest stay of any child was 19 days but only 6 of 171 children stayed 14 days or longer. Among those children staying less than one day, 18 died. The data in Table 4 are therefore restricted to those children discharged alive thus more accurately reflecting the duration of treatment judged to be required for the children in question.

Table 4 Length of Stay of Admitted Neonates by Unit Discharged Alive ONLY

Length of Stay	Luxor	Aswan
< 1 Day	1.5	8.9
1 - 3 Days	40.0	37.5
4 - 6 Days	33.8	37.5
7 - 19 Days	24.6	16.7
N	65	56

The outcome for admitted children is very similar in both units though the Aswan unit has a slightly higher case-fatality ratio (Table 5). Of the 4 to 5 percent of children discharged sick

from each unit many were sent to other neonatal units though a few were removed by their parents against the advice of the doctor

Table 5 Discharge Status of Admitted Neonates by Unit

Weight	Luxor	Aswan
Healthy	68 5	63 4
Sick	4 5	4 9
Dead	27 0	31 7
N	89	82

The final component of this assessment was to follow-up all children discharged alive one week after their discharge. The assumption is that a child who dies within a week of discharge has generally died of a disease related to his admission to the unit. Among the children for whom data is available to date 7 of 84 children (8.3) discharged alive had died within a week of leaving the unit 4 in Luxor, 3 in Aswan. Thus of the total of 171 children for whom data are available 57 (33 percent) died either in the unit or within a week of discharge. The "total" case-fatality ratio with the deaths within a week of discharge included is 31 in Luxor and 35 in Aswan.

In future reports we will examine more closely the deaths occurring in the neonatal units.

#### NOTES ON NEONATAL UNIT OBSERVATIONS

Observers were present in the units 24 hours per day for a full month. Three observers worked through the month, each working an 8 hour shift each day. Friday was given as a holiday. No observations were made on Fridays. The observers recorded some basic information on the unit during their shift: the number of children present at the beginning of the shift, the number

admitted and discharged, the number present at the end of the shift similar information for nurses whether a nurse was present in the unit at all times and whether a doctor made any visit to the unit during the shift, the response time of doctors when called by the nurse They recorded each time any person entered the unit and the basic behaviors of these persons--changing or covering shoes hand washing, putting on a sanitary coat to cover street clothes Whenever a nurse or doctor gave a child any care, the specific action was noted (usually in precoded columns), along with the ID number of the child (Thus, in the future it will be possible to link specific care with the outcomes of specific children for those children in the unit during the month of observations ) Also the times of entry and exit from the unit was recorded for all nurses and doctors, so it will be possible to examine in some detail the traffic flow experienced by the units

These data are not currently available for analysis However we have reviewed a substantial amount of the data and have some general impressions of the likely results

Basic infection control measures are poor in both units The Luxor unit was described by one of the observers as a "souk" (marketplace), because so many people particularly many with no work responsibilities in the unit were constantly flowing in and out While the flow of people into and out of the Aswan unit is even higher, most of these people have work responsibilities in the unit In both units however, hand washing is uncommon as is wearing a sanitary coat over street clothes Hand washing is particularly uncommon once a care provider has entered the unit and moves from one child to the next This may be largely because there is no place to wash hands within the Aswan unit, and the Luxor unit is frequently without water altogether

In both units there are times when no health professional is in the unit. This is particularly common in Luxor where at most times just one nurse is assigned to the unit. However, this occurs in Aswan as well where more than one nurse is generally on duty.

Further analysis of the observation data will provide substantial details on the treatment of children.

## CONCLUSIONS

The units in Luxor and Aswan no doubt provide a valuable service to the community. Many children who would in the past have died of low birth weight, infections, trauma, or other problems are now saved. But, as seen in this report, the children who reach the neonatal unit are a very select group, and there is still substantial progress that can be made in improving the care delivered, and thus the still fairly high level of mortality recorded in the units.

Some of the most important actions that could be taken are also some of the simplest in terms of technology. Hand washing and other basic measures of infection control are key examples. A review of the data, yet to be confirmed by careful analysis, suggests that greater efforts to more accurately diagnose the child's illness, and thus to be able to provide more focused treatment could also be important.

We expect to soon begin further analysis of these data and expect that this will help to clarify the assessment of the neonatal units.