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THE USE OF PERFORMANCE INDICATORS IN SOUTHAMPTON AND SOUTH-WEST HAMPSHIRE HEALTH AUTHORITY - A PILOT STUDY

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APPENDICES

1.0 Introduction and Overview:

1.1 This report describes a study intended to explore how nationally-available performance indicators might be used to identify strengths and weaknesses in the services available within a district. The original terms of reference for the study envisaged three stages of work with the present report marking the end of the first stage. The terms of reference for this first stage were:

'... (to prepare) .. a report highlighting the lessons which can be learned about Southampton from an examination of both the Wessex and National books of indicators. This report should highlight where Southampton appears to be doing well and perhaps more importantly the areas which require further in-depth examination with a view to saving money'*

Although the desirability of proceeding to the later stages is seen as in large part dependent on the outcome of the work described in this report, both have complementary objectives. Thus the objective of the second stage is seen as 'to interpret and make use of the information presented in the initial report' while that for the third stage 'should be to train staff to understand and make good use of Performance Indicators'. In many respects, therefore, the present stage of work represents little more than a first trawl through the available data to establish whether further work is warranted. Hence the term 'pilot study' in the title.

1.2 Despite the limited objectives of the present work it is important to note at the outset that the study represents only a partial response to the original terms of reference. In particular, although the terms of reference above envisaged a study highlighting the District's strengths as well as its weaknesses, this report is concerned largely with the latter. This can in part be explained by the fact that the work focuses on a small number of 'hypotheses' many of which were orginally identified at the Regional Performance Review and almost all of which, related to potential service 'inefficencies' or the suspect' use of resources. The fact that the study might be interpreted as 'exonerating' the District in certain respects, means that there is a sense in which the study does draw attention to what could be some of Southampton's strengths. On balance however, the work has been largely diagnostic in the sense of trying to cast some explanatory light on a number of Southampton's 'suspect' indices.

1.3 Although Section 2.0 below draws attention to certain methodological limitations inherent in the work, it is

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* Enclosure F: Southampton and South West Hampshire Health Authority DMT Papers, 19th October, 1984.

appropriate to underline two of these here. First, in common with any study which relies solely or primarily on nationally-available performance data, the work described here is extremely uneven in its coverage. That is to say, it is focused almost exclusively on measures related to institutional (as distinct from Community) 'performance' and looks soley at measures of resource 'inputs' and service 'throughputs' to the virtual exclusion of patient-related service 'outputs' (see Best, 1984). Secondly, very few of the study's findings can be regarded as conclusions in the sense that they provide a basis for management action. Rather, the principal 'findings' of the study are the identification of those areas in which further analytical investigation is likely to be of greatest value.

1.4 Despite these (and other) drawbacks, the work described here probably does have a number of implications for the management of services in Southampton. First, the findings of the study do tend to show that in a small number of cases 'suspect' indicators are so only because they have not been viewed in context. Such indicators clearly do not require the further attention of management. Secondly, a second set of 'suspect' indicators would appear to require further investigation if only because they are symptomatic of patterns of resource use which management ought to have a better explanation for than they at present have. (Of course, such indicators may also be symptomatic of patterns of resource use which provide opportunities for effecting resource efficiencies, service improvements, or both). Thirdly, the findings of this study, taken as a whole, do tend to suggest that the sensitive and accurate interpretation of performance indicator data requires the involvement of managers, staff and in some cases perhaps patients, 'at the coal face'. Whether or not this constitutes a finding with management implications will depend in part, of course, on whether such groups can be involved productively in the interpretation of this report.

1.5 The remainder of the report is organised as follows:

-Section 2.0 describes the approach to the study and draws attention to some of the limitations in the methodology adopted.

- Section 3.0 presents the main findings of the study in relation to the data upon which the findings are based.

- Section 4.0 summarises the above findings and puts forward three options for building on the present study.

Appendix C which contains the figures and tables relevant to the findings in Section 3.0, has been bound separately for ease of reference.

2.0 APPROACH ADOPTED:

2.1 The national set of performance indicators are intended to allow Districts and other units of management to develop a comparative view of their own 'performance' and use of resources. The introduction to the 1983 summary book of NHS indicators states:

'The objective of the interpretation of the performance indicators is to gain an overall view of a district's deployment of resources as compared with the deployment in other districts. The indicators are presented as a starting point for a district's assessment of performance not its conclusion.

and further:

'No single indicator, or combination of indicators will reveal whether performance is 'good' or 'bad', 'efficient' or 'inefficient'. A first look at the indicators will do little more than point to the most pressing questions about unusual or atypical behaviour which need further investigation. It is this further exploration and analysis which may provide answers.' (pages 6,7).

2.2 The principle underlying this 'diagnostic' use of performance indicators is that known as 'management by exception'. According to this view, performance measures which are 'unusual' or 'atypical'(ie, are noticeably high or low in relation to the distribution of prevailing measures) are intrinsically interesting because they represent either:

i) an innovation in the sense that the aberrant measure reflects a new way of doing work and/or of deploying resources. (This then poses the policy-maker or manager with the problem of whether such an innovation can and/or should be encouraged).

ii) a failure in the sense that the aberrant measure reflects a wasteful or otherwise inefficient or ineffective deployment of resources. (In this case, the policy-maker or manager is faced with the problem of devising ways to discourage such practices).

iii) a 'local idiosyncracy' in the sense that the aberrant measure reflects a peculiar workload or other externally-imposed condition (eg, a complex case mix; a teaching responsibility) which may or may not provide an explanation (and justification) for the observed aberration. (In this case, the policy-maker or manager is faced with the problem of deciding which 'local' or other externally-imposed conditions warrant making exceptions to the more general rule).

2.3 As implied earlier, however, the NHS performance data which are available suffer from a number of shortcomings which mean that exceptional or aberrant measures defy such neat interpretation and categorisation. Rather, most aberrant measures tend in

practice to fall into one of two much less satisfactory categories.

Either they are measures which tend to be aberrant for a variety of difficult-to-test local reasons (eg. a new ward being commissioned half way through the financial year); and/or the available data do not allow abberant measures to be followed up to the point where they can be assigned to any of the above three categories with any reasonable degree of confidence (see Section 3.0 below).

2.4 The practical difficulties of utilising presently available data to arrive at judgements about the performance of individual districts are amply illustrated later in this report. Three of the deficiencies characteristic of the data and which serve to obscure their performance implications are, however, worth underlining at this point:

* Lack of conceptual clarity: as often as not, it is extraordinarily difficult to reach agreement on what it is that an individual indicator is intended to measure and, perhaps more to the point, what might cause the indicator to take on different values. For example, many of the indicators are ratios expressing resources or money in relation to service workload, or the ratio of two resources to one another. Such ratios can assume particularly high or low values for a variety of reasons: for instance, because the numerator is particularly high or low; or because the denominator is particularly high or low; or because both the numerator and the denominator are 'somewhat' high or low in different directions; or because one or both are defined measured and/or recorded slightly differently from one district to another; or, in individual cases, for a variety of other reasons. In looking through what is apparently the same ratio for all the districts in a region therefore, it is often the case that ratios near the average are so for quite different reasons, while those which appear aberrant may similarly appear so for different reasons. In such circumstances, it is often difficult to think through what such a list of ratios is meant to be measuring and what, if anything, this may have to do with performance.

*Lack of distributional information: although the Summary Booklets of Indicators do incorporate some distributional information in the form of histograms for some of the indicators, such histograms are of limited use in interpreting aberrant values. Thus, while many of the histograms show how NHS districts are distributed across different values of an indicator, they give few if any insights into why such an indicator might take on different values and therefore, why the districts might be distributed as they are. For example, unit costs (such as cost per case) are typically high at both low and high levels of output (ie. at low levels of output, fixed costs are spread over a small number of cases leading to a high cost per case

while, at high levels of output, variable costs are high thus leading - for an entirely different reason - to a high cost per case). In such circumstances, the indicator 'cost per case' tends to be distributed in a 'u' shaped fashion with high values at either end of the 'u' (ie. at low and high levels of output). This of course means that two districts or institutions can have the same or very similar aberrant (high) costs for entirely different reasons. The lack of distributional information, however, means that it is impossible to distinguish between two such districts or institutions.

*Redundancy and overlap between indicators:
Many of the indicators would appear in part at least, to be redundant in the sense that they would appear to be measuring something very similar to one or more of the other indicators included in the booklet. That is to say, many of the indicators would appear to be attempts to measure different variations on the same 'performance theme'. This applies particualrly to many of the clinical activity, manpower and unit cost indicators which often tend to vary together for what are probably similar reasons. For example, districts whose acute hospitals have a high bed throughput tend, on the whole, to be the same districts with high unit costs in the acute sector. In addition, these tend to be the same districts with higher than average manpower levels - an unsurprising observation perhaps - in that all three variables tend to reflect the fact that occupied beds consume more resources than do unoccupied ones. In these circumstances, it is clear that a fairly large number of inter-related and overlapping indicators are being offered as a difficult-to-interpret and imperfect surrogate for a single performance dimension - namely, intensity of patient-related activity per unit of resource consumed. Such a confused and imperfect relationship between the indicators and the underlying dimension of performance, does little to facilitate the process of arriving at useful and valid performance assessments.

2.5 The overall approach to the present study therefore, was shaped by three principle considerations:

(i) first, a commitment to test the potential usefulness of presently available performance data whatever their drawbacks;

(ii) second, a desire to adopt a methodology which - as far as possible - offset and minimised the importance, of the weaknesses in the data; and

(iii) thirdly, the recognition that the primary purpose of a pilot study is to provide a clear indication of whether, and in what areas, further study may be warranted.

2.6 As noted earlier, the starting point for the study was the results of the Regional Performance Review. This review resulted in the identification of a number of indicators on which Southampton appeared to be aberrant and where there was at least some doubt about the explanation offered by the District. In addition, further study of the Wessex Summary Book of Indicators revealed a number of further abberations which, it was felt, deserved some investigation. In all, these two reviews produced eleven observations or questions about the District which provided the starting point for the study (see 3.0 below).

2.7 The methodological problem therefore, was how to cast some light on these questions while taking account of the three considerations set out in 2.5 above. The approach adopted had two principle characteristics:

i) First, no indicator was examined in isolation but rather was always viewed in the context of a group (usually between 3 and 6) of interrelated indicators. Whenever possible, an attempt was made to examine interrelated input throughput and 'output' indicators - although frequently, throughput or activity level indicators had to be used as surrogate measures for output.

ii) Secondly, whenever possible comparisons were made over time as well as between districts (or institutions).

2.8 Both of these principles were adopted in order to try to avoid the worst of the pitfalls set out in 2.4 above as well as to maximise the chances that like was being compared with like. In addition, every candidate 'finding' of the study was continuously reviewed in the light of the fact that all of the indicators being studied were institutional measures which take little or no direct account of community and other extra-institutional considerations.

2.9 The principle analytical side utilised during the study was the Barber-Johnson diagram. This was used in two quite different ways to examine both inter-district as well as time series comparisons. The first way in which the diagram was used is in its more traditional form. Used in this way, the diagram allows four different measures of bed usage to be compared over time and/or in relation to a selected input measure such as cost per inpatient day, or nursing staff per occupied bed. The use of the diagram for this purpose is explained in Appendix A*. In this form, the four measures of bed usage - or throughput - stand in as activity level surrogates for hospital output which can then be looked at in relation to one or more of the inputs which are necessary to produce that 'output'.

*Reproduced with the kind permission of J Yates (ref 3 AppxB)

The second way in which the Barber-Johnson diagram can be used is to examine the inter-relationship between unit costs, total costs, a measure of activity level or throughput, and one input necessary to produce that activity or throughput. This use of the diagram is illustrated in figure 2.1 below:

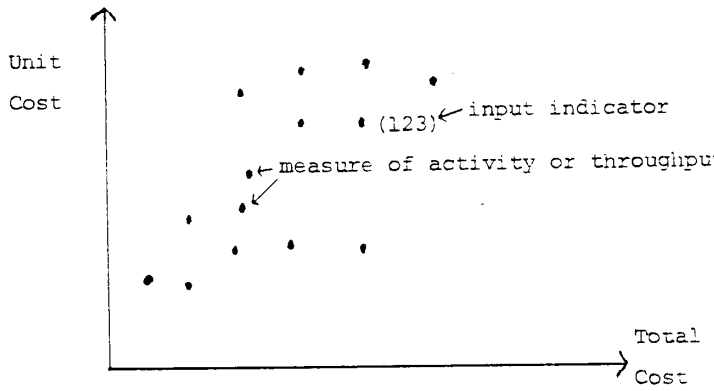

Figure 2.1 The Barber Johnson Diagram

This use of the diagram is perhaps best illustrated by reference to four indicators related to hospital catering. In this case, the unit cost might well be the cost per meal served and the total cost that of the catering budget. The individual dots would then represent the number of meals served in different hospitals or in the same hospital in different years. Finally, the number in brackets might be a resource input such as the number of catering staff per meal or per patient day. Used in this way, the diagram facilitates the examination of (say) aberrant unit costs or staffing levels in relation to three other related variables either across different hospitals and/or over time.

2.10 It should be emphasised that the Barber Johnson diagram does not produce 'answers' or unequivocal interpretations of 'suspect' indicators. As should become clear in section 3.0 which follows, however, the use of the diagram does facilitate the systematic investigation of aberrant indicators which, in isolation, often have little meaning.

3.0 THE PRINCIPLE FINDINGS:

3.1 In presenting the findings of this study it is appropriate to emphasise once again that few of the findings qualify as 'results' in the sense that they have clear implications for management action. Rather, they constitute more of a record of how the 'suspect' indicators for a particular district were investigated in a short period of time using relatively

unsophisticated 'diagnostic' aids.

3.2 As noted in 2.6 above, the starting point for the investigation was the identification of a number of indicators which portrayed Southampton as in some sense aberrant or 'out of the ordinary'. These, in turn, gave rise to eleven observations or questions about the District which were the focus of the study. In order to provide an overview of the intended scope of the study, these eleven observations are listed below:*

3.2.1 The District's main acute hospital (610 beds), the Southampton general (SGH), has a surprisingly high cost per patient day (p.89)

3.2.2 A surprisingly high proportion of the SGH's costs would seem to relate to medical staff and clinically related support services (p.89)

3.2.3 Clinically-related support service costs in the District's other main acute hospital, the Royal South Hants (356 beds), would also seem to constitute a surprisingly high proportion of total costs (p.89).

3.2.4 Four of the District's five small mental handicap units would seem to have high domestic and cleaning costs (p.123)

3.2.5 The District's maternity hospital, the Princess Anne (208 beds), would seem to have particularly high catering costs (p.90)

3.2.6 The District's acute psychiatric unit (Dept of Psychiatry, 91 beds) would seem to have a particularly high cost per inpatient day (p.115/116).

3.2.7 The acute hospitals in Southampton would seem to employ a particularly high number of professional and technical staff relation to other staff numbers (p.131).

3.2.8 Accident and emergency costs (per case) in the district would seem to be particularly high (p.124/125).

3.2.9 The domestic and cleaning costs in the District's geriatric and long-stay hospitals are high (p.113).

3.2.10 The nursing staffing levels (per inpatient day) in the district's acute sector would appear high (p.135).

3.2.11 The Western Hospital - the District's other main

*The page numbers in brackets are from the DHSS Summary Book of Indicators for the Wessex Region. These refer to the principle indicator or indicators giving rise to the observations.

acute unit (204 beds) - would appear to have high domestic and cleaning costs.

3.3 The Summary Book of Indicators sub-divides performance indicators into 7 types (e.g. manpower, finance, clinical activity, etc). However, not all of these types are compatible - some being available by district-wide basis only, while others are available on an institution-by-institution basis. Consequently it is not always possible to compare activity levels with costs and (say) manpower in a way which allows observations such as those above to be systematically investigated. For example, while nursing costs per inpatient day (or case) are available on an institutional basis, nursing establishment data are only available on a District-wide basis. Thus, it is difficult at best to determine whether there may be a link betweeen observations such as 3.2.1 above (which reltes to high costs in the acute sector) and 3.2.10 which may be one of the reasons for the high costs.

3.4 For this reason, the findings which follow cannot always be neatly associated with a single observation. The findings are therefore presented under headings which draw attention to the observation or observations to which they relate.

(1) Observations 3.2.1 and 3.2.2 (possible implications for3.2.7)

Because the SGH is the district's main acute unit consuming some 35% of Southampton's £77m budget, a large part of the study was devoted to observations 3.2.1 and 3.2.2 above. In particular, an attempt was made to answer two questions: first is the SGH an expensive hospital as provincial teaching hospitals go? and secondly, if so, what would seem to be the cause(s)? Figures 3.1-3.7 and tables 1 and 2 of Appendic C summarise the principle findings in relation to these two questions.

For a number of years, the SGH has been an expensive hospital when examined on a cost-per-inpatient day basis. However, when SGH was compared with other provincial teaching hospitals on a cost per case (ie. on a workload-related unit cost) basis, this apparent costliness tended to disappear. In other words, traditionally SGH had been held to be expensive because it was busy and, on the whole, busy hospitals are expensive hospitals.

To see if this still 'explained' the observations in 3.2.1 above, figures 3.1 and 3.2 of Appendix C were constructed. These compare the cost of SGH to the costs of two other provincial teaching hospitals of similar size and bed complement, as well as to the national average for all provincial teaching hospitals for the period, 1977/8 - 1982/3. Figure 3.1 confirms the long-standing impression that SGH is an expensive hospital on an

inpatient day (IPD) basis. Figure 3.2 however, tells a somewhat different story from the more traditional one. Here, it can be seen that while SGH was not a particularly expensive hospital on a per case basis for the period to 1980/81, this pattern has been broken in the 2 most recent years. Indeed, for the two years 1981/82 and 1982/83, SGH has become one of the most expensive provincial teaching hospitals on both a IPD and a per case basis.

This observation is confirmed in the Barber-Johnson (B.J.) diagrams shown in figures 3.3 - 3.6. As can be seen in figures 3.3 and 3.4, for example, while there is a clear tendency for the busier hospitals (ie. those closest to the origin) to be more costly on an IPD basis, the costs of SGH still appear high. Indeed, SGH is the most expensive provincial teaching hospital in the United Kingdom for 1981/82 and 82/83 even though in both years, some of the other hospitals had similar or even greater inpatient workloads.

Figures 3.4 and 3.5 give a somewhat different impression. Here, there is a clear tendency for hsopitals closer to the origin of the diagram to have lower unit (ie. per case) costs than those farther away. This might well be expected in that as the scale of inpatient activity increases, unit costs (such as cost per case) will have a clear tendency to exhibit 'economies of scale'. In this light, it is clear that while SGH is not the most expensive hospital on a per case basis, it is still relatively expensive. That is to say, it would not appear to be benefiting from the economies which might be expected to follow from its scale of activity. Were SGH to be benefiting, its per case costs might well be expected to resemble those of the other hospitals in its immediate vicinity on the B.J. diagram - i.e. something like £700 - 750 in 1981/82 rising perhaps to £750 - 800 in 1982/83.
In an attempt to provide further insights into these observations, some of the characteristics of the inpatient workload of a sample of (apparently similar) provincial teaching hospitals were examined for the period 1977 - 78 to 1982 - 83. The results of this are summarised in figure 3.7. Here, it can be seen that for the period 1977/78 - 1980/81, SGH dealt with one of the highest workloads of all provincial teaching hospitals increasing bed utilisation significantly throughout the period.

The period 1981/82 and 1982/83, however, which incorporated the 1982 industrial actions, shows all the hospitals (with the exception of the Leicester Royal Infirmary) reversing this pattern of continuously improving bed utilisation. (Thus all of the hospitals shown move either toward the right of the diagram and/or away from the origin). It is interesting to note that while the general pattern exhibits a drop in bed utilisation resulting from an increase in 'bed emptiness' (ie. a move toward the right of the diagram), this is far less true of the SGH. Indeed, in 1981/82, while the average length of stay increased to 7.5 days at SGH, this was not at the expense of bed emptiness.

Equally, while in 1982/83 there was some increase in turnover interval, SGH's bed occupancy was still far higher than all of the other hospitals shown. Such a pronounced change in the relationship between length of stay and turnover interval without a 'compensating' increase in 'bed emptiness' implies a significant shift in case mix - an observation which could well provide a part of the explanation for SGH's high costs in recent years.

Table 1 contains the base data for six of the provincial teaching hospitals included in figures 3.1 - 3.7. Examination of these data confirm the impressions gained from the diagrams and in particular, show the relative escalation in SGH's costs during 1981/82 and 1982/83. One additional 'explanation' for this increase, however, is suggested by the table. The Princess Anne (PA) maternity hospital was until 1980/81, part of SGH. Since that time, however, the PA has been a separate institution with its costs recorded separately from the SGH. Equally, its case load is now separately recorded. In so far then, as SGH is being compared with other provincial teaching hospitals whose unit costs and case load incorporate an obstetric component, it may be that the SGH appears expensive simply because like is not being compared with like.

To cast some light on this possibility, it is interesting to examine the data shown in the last 6 rows of Table 1. Here, the unit cost and workload data for the PA were combined with those for SGH to produce a 'synthetic' SGH inclusive of an obstetrics unit. As can be seen, these data tell a quite different story - and one very similar to that which prevailed before the commisioning of the PA in 1981. Namely, that of a very busy provincial teaching hospital with a relatively high IPD cost but a far from exceptional cost per case.

When these 'synthetic' data are plotted on the B.J. diagram shown in figure 3.7, this same impression emerges. Indeed, the 1977/78 to 1982/83 'trajectory' of the combined SGH and PA hospitals has very much the same shape as most of the other hospitals shown. At the same time, it is a much busier hospital than most of the other provincial teaching hospitals - a characteristic which tends to be refelcted in high unit costs.

Although the opening of the PA hospital would seem to explain SGH's apparently high costs, it is not obvious that this explains observations such as 3.2.2 and 3.2.7 above. For this purpose, it is useful to refer to the data in table 2. Table 2 looks at SGH's component costs in relation to other U.K. provincial teaching hospitals. The numbers in the table are SGH's national ranking for each component cost for the period 1977/78 - 1982/83. These are shown on both an IPD basis (left hand side) and a per case basis (right hand side). Looking at the third row of numbers in the table, for example, shows that in 1977/78 the SGH was the third most expensive provincial teaching hospital in

terms of nursing staff expenditure per IPD, while by 1982/83, it had dropped to fourth (out of 20 hospitals). By contrast, SGH was the 11th most expensive in 1977/78 on a per case basis, moving up to 9th by 1982/83.

Besides confirming the two earlier impressions that SGH is a much more expensive hospital per IPD than per case, and that per case costs have jumped in the last two years, the table contains certain other potentially interesting messages. Perhaps the most interesting observation is that SGH's patient-related variable costs increased dramatically over this period and, in almost all cases, much faster than non-patient related and 'semi-fixed' costs. For example, on a per case basis, MSSE costs have gone from 11th in 1977/78 to 3rd in 1982/83; Pharmacy costs from 14th to 7th; Radiology from 13th to 4th; Medical Physics from 11th to 1st; and so on through Physiotherapy, Linen, Medical Records, etc. This could well provide a part of the explanation for some of the aberrant acute sector indicators in Southampton, as well as suggest that there may be more to SGH's high unit costs than simply the commissioning of the Princess Anne.

(ii) Observation 3.2.3:

Although time did not allow for a detailed examination of those data which may help to explain some of the apparently high support service costs at the Royal South Hants (RSH), figures 3.8 and 3.9 do suggest that this may well be a topic worth further investigation. The Barber Johnson diagrams shown in figures 3.8 and 3.9 are the same as those in 3.3 - 3.6 except here, the comparisons are with other acute hospitals in the Wessex Region rather than with provincial teaching hospitals. Again, the cost per IPD diagram (figure 3.8) demonstrates a clear tendancy for the hospitals to become more expensive as their inpatient workload increases, while figure 3.9 again exhibits a tendency toward 'economies of scale' as workload increases. In both cases, however, RSH stands out. In figure 3.8, for example, its costs would appear relatively high by comparison with other hospitals dealing with a similar workload, while in figure 3.9 RSH shows no evidence of benefiting from 'economies of scale'. As is suggested in Section 4.0 below, these observations both imply that further investigation of RSH's costs and workload characteristics would be worthwhile.

(iii) Observation 3.2.5:

Again, the study did not allow for adequate investigations of the apparently high unit catering costs at the Princess Anne Hospital. Nevertheless, it was possible to examine superficially the hypothesis that such costs should also reflect economies of scale. Figure 3.10 summarises the exploration of this hypothesis.

If unit catering costs do, in fact, reflect such economies, then

the relationship between these costs and a measure of scale - such as case throughput - should resemble a curve like that shown in the figure 3.10. If this is the case, the catering costs at Princess Anne would appear to be relatively high. If, on the other hand, unit costs and scale are related via a linear, straight line relationship, then on figure 3.10 the 'best fit' line would pass through the data point representing PA's costs. Obviously, this would suggest that these costs were in line with those of the other acute hospitals in Wessex. Depending on the scale of savings which might result from a rationalisation of the PA catering service, this may again be another area worth further investigation.

(iv) Observation 3.2.6:

Although there was little opportunity to look into the apparently high costs of the Department of Psychiatry, the data included in the Summary Book itself did offer insights into why these costs may in fact be high. In particular, Table 30 on page 116 of the Wessex Summary Book gives the percentage component costs for each of the mental illness hospitals in the Region. Close examination of these costs reveals that Southampton's Department of Psychiatry stands out in one important respect. Thus, if the component costs are divided into two types - namely, clinical and non-clinical* - it is clear that the Department of Psychiatry is different from every other mental hospital in the Region. This difference is summarised in the table below:

	% Clinical Costs	% Non-clinical costs
Dept of Psychiatry	74.2	25.8
Regional Average	57.8	42.2
Regional Average exc. Dept of Psychiatry	56.4	43.6
National Average	57.6	42.4
Next most similar hospital in Wessex (Weston Lodge, Bath).	65.7	34.3

*Clinical costs include medical staff; nursing staff; surgical supplies; pharmacy; diagnostic services and paramedical services. Non - clinical include administration; catering; domestic and cleaning; laundry services and estate and general services.

These figures clearly imply that the Department of Psychiatry is in some sense a more 'clinical' hospital than the other mental hospitals in the Region. This may or may not account for the observed high costs but is clearly worth further examination.

(v) Observation 3.2.9:

All three of the geriatric and long stay hospitals (ie. Lymington, Ashurst and Moorgreen) in Southampton would appear to have relatively high domestic and cleaning costs. Because this was true of all three hospitals (suggesting a district-wide effect), an attempt was made to look at this aberration in some detail. The results of this examination are summarised in figures 3.11 - 3.13.

Figure 3.11 displays the relationship between unit and domestic and cleaning (d&c) costs, total costs and the case throughput of geriatric and long stay hospitals. ALthough there are a number of exceptions, there is a clear tendency for unit costs to increase as case throughput increases and all three of the Southampton hospitals are examples of this. Although there is no obvious reason why d&c costs should increase with patient throughput in a long stay hospital, figure 3.12 confirms that there is such a relationship*.

To examine the possibility that the relationship between unit costs and throughput might be a more structural one (and not limited solely to d&c costs), the B.J. diagram shown in figure 3.13 was constructed. This figure confirms the impression that busy hospitals tend to have higher unit costs (ie. tend to be closer to the origin), than do less busy ones. The three Southampton hospitals are no exception to this and, indeed, would appear to have somewhat low (overall) unit costs by comparison with the other long stay hospitals in Wessex.

It is unclear therefore, just why the Wessex long stay hosptials should have what would appear to be aberrant d&c costs. The relationship with case throughput suggests that one possible explanation may be that domestic staff are engaged in what - in other districts - might be recorded as nursing duties. Whatever the explanation, this represents yet another area which probably deserves further investigation.

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*The three data points marked (WD)represent the unit costs of the three West Dorset HA long stay hospitals. Although why West Dorset hospitals should be exceptions is unclear, if they were to be regarded as 'outlyers', the relationship between d&c unit costs and throughput would be even more pronounced.

(vi) Observation 3.2.10 (possible implications for observations 3.2.1 and 3.2.7)

The suggestion that the acute hospitals in Southampton would appear to have relatively high nursing establishment levels was briefly (and superficially) examined utilising the Barber-Johnson method. The results of this brief examination are illustrated in figures 3.14 and 3.15. Figure 3.14 arrays nursing establishment levels (vertical axix) in relation to workload (horizontal axis) to test the possibility that the pattern of acute nursing establishment should, like a number of other acute sector inputs, exhibit 'economies of scale'. If this were to be the case, of course, the bracketed figure shown in 3.14 (ie. nurses per acute bad) should, in theory, become smaller as one moves from left to right on the diagram.

There is some evidence for such economies if the Southampton and Isle of Wight figures are ignored. That is to say, there is a clear tendency for the number of nurses per acute bed to fall as total nursing workload increases, with the exception of these two districts.

To test again whether this kind of effect might be present, the B.J. diagram shown in figure 3.15 was constructed. Here, the evidence is mixed, although whatever theory is held about economies of scale, the unit nursing costs at the Royal South Hants are clearly worthy of further investigation. Indeed, these figures suggest that the high nursing staff levels implied by figure 3.14 may not be a district-wide phenomena at all but rather a problem largely confined to the RSH.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

4.1 In order to assist in the interpretation of the above findings and the insights gained during the study more generally, the follwing list attempts to summarise the principle conclusions of the work:

4.1.1 The component cost structure of SGH deserves further study. These should probably be compared with the cost structure of similar provincial teaching hospitals elsewhere. There may well be considerable scope for effecting savings in spending on the medical support services at SGH.

4.1.2 The component cost strucutre of the RSH should be examined in relation to similar actue units elsewhere. Particular attention should be paid to the unit costs of clinically-related support services. Unit nursing costs should also be examined in relation to nursing

workload and nurse staffing levels.

4.1.3 The domestic and cleaning costs throughout the district and in particular, in the long stay hospitals, should be further investigated. This is one area in which Southampton's practices appear to be particularly costly and therefore, one area in which considerable savings may be possible.

4.1.4 The possibility that domestic staff are undertaking nursing duties in Southampton's long stay hospitals should be investigated.

4.1.5 The catering costs at the Princess Anne would appear to require further justification.

4.1.6 The costs of the Department of Psychiatry are high: there would appear to be 'clinical' reasons for this, although this too should probably be justified more explicitly.

4.1.7 This study did not provide an opportunity to examine the high A&E costs of the district nor the costs of the Western Hospital. There would appear to be good reason for examining both of these. (see 3.2.8 and 3.2.11 above).

4.1.8 Before further work is undertaken, the results of this study should be more widely disseminated within the District. This is the best guarantee that further work will not be abortive.

APPENDIX B : REFERENCES

1. BEST, G (1983) 'Performance Indicators : a precautionary tale for Unit Managers'
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2. DHSS (1983) Performance Indicators Regional Summary for 1981 (Wessex)
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THE USE OF PERFORMANCE INDICATORS IN SOUTHAMPTON AND SOUTH-WEST HAMPSHIRE HEALTH AUTHORITY : A PILOT STUDY

APPENDIX C : FIGURES AND TABLES

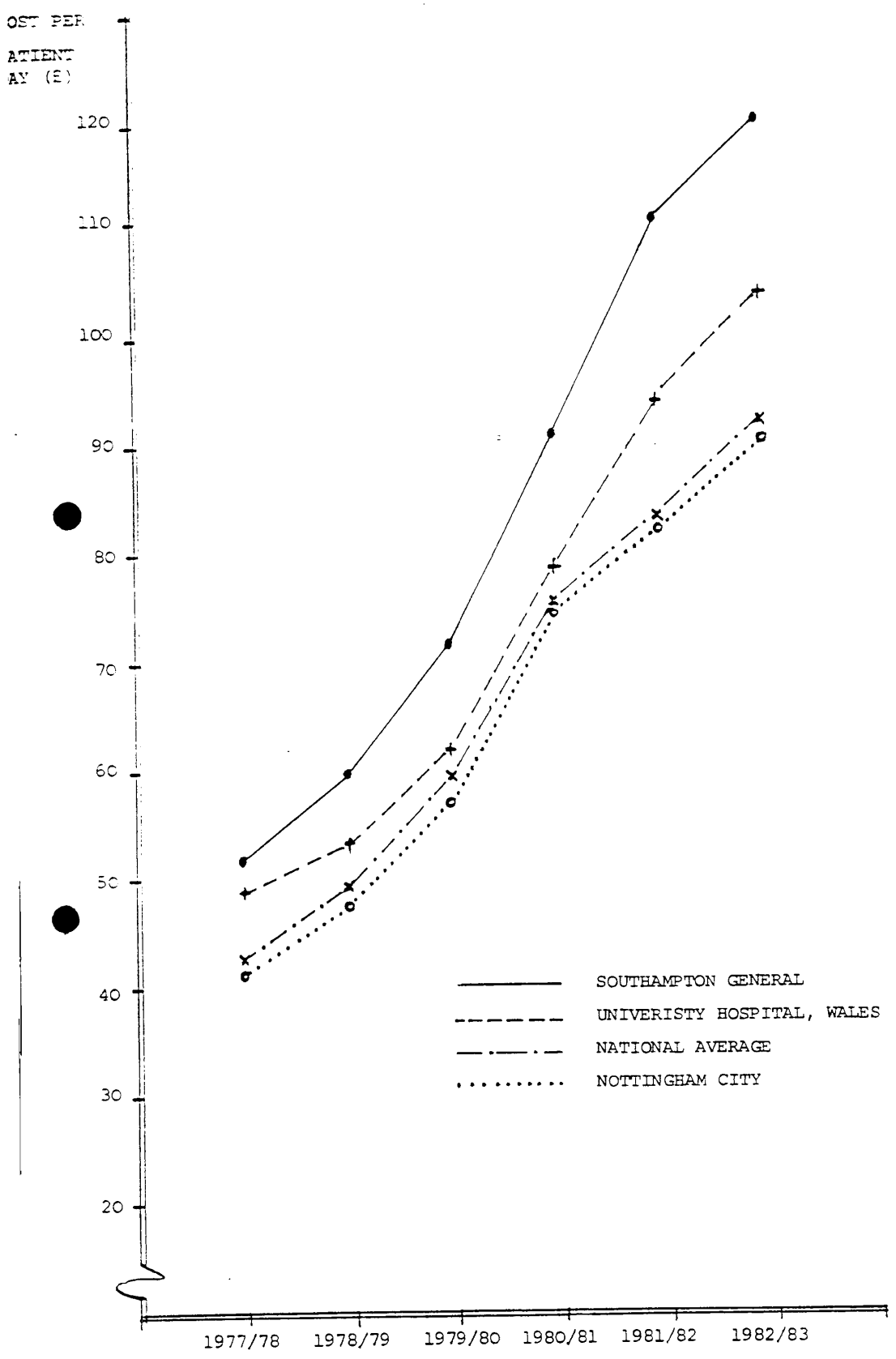

FIGURE 3.1 COST PER INPATIENT DAY: SELECTED TEACHING HOSPITALS 1977/8 - 1982/83

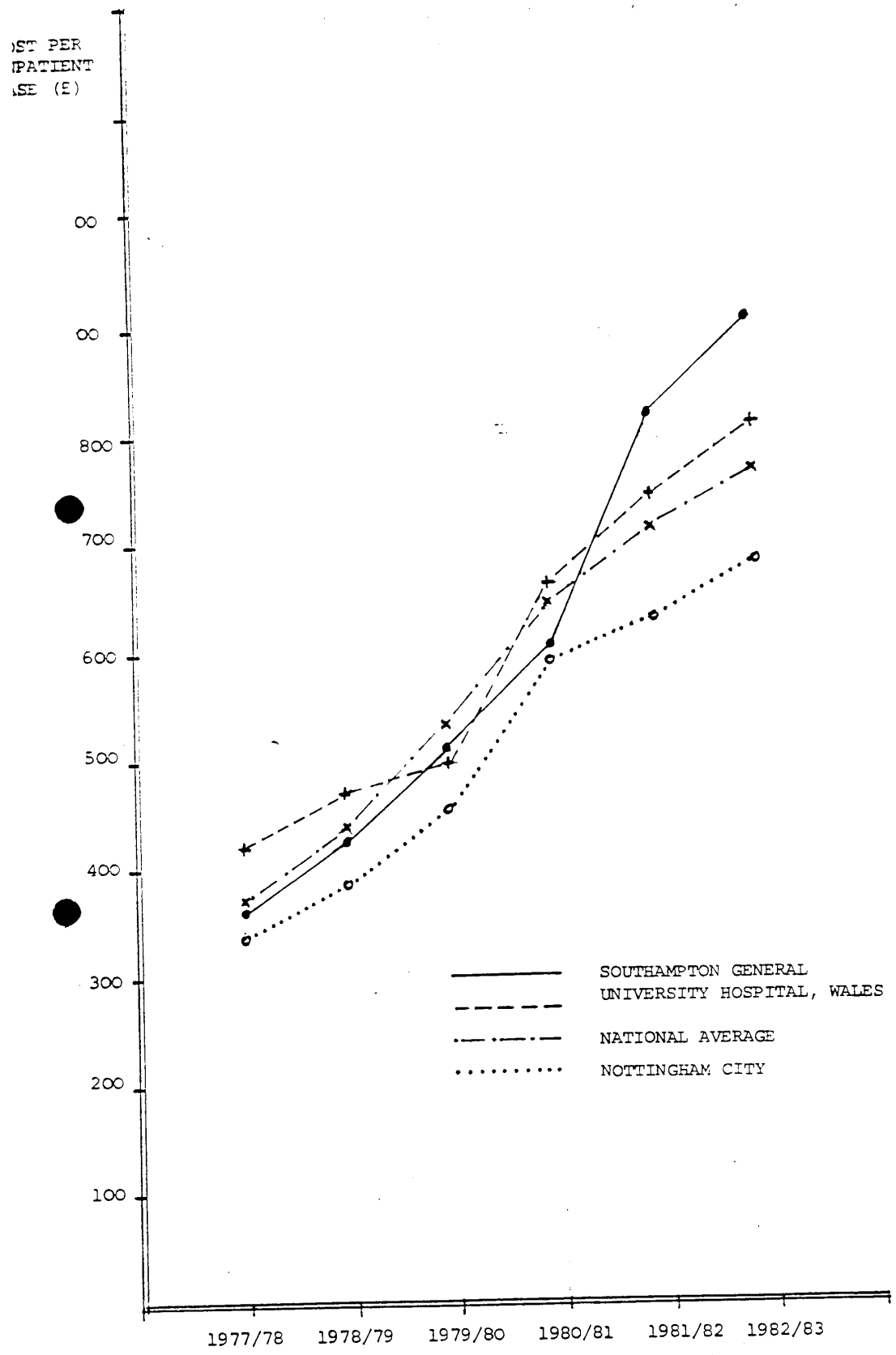

FIGURE 3.2 COST PER INPATIENT CASE: SELECTED PROVINCIAL TEACHING HOSPITALS 1977/8 - 1982/83

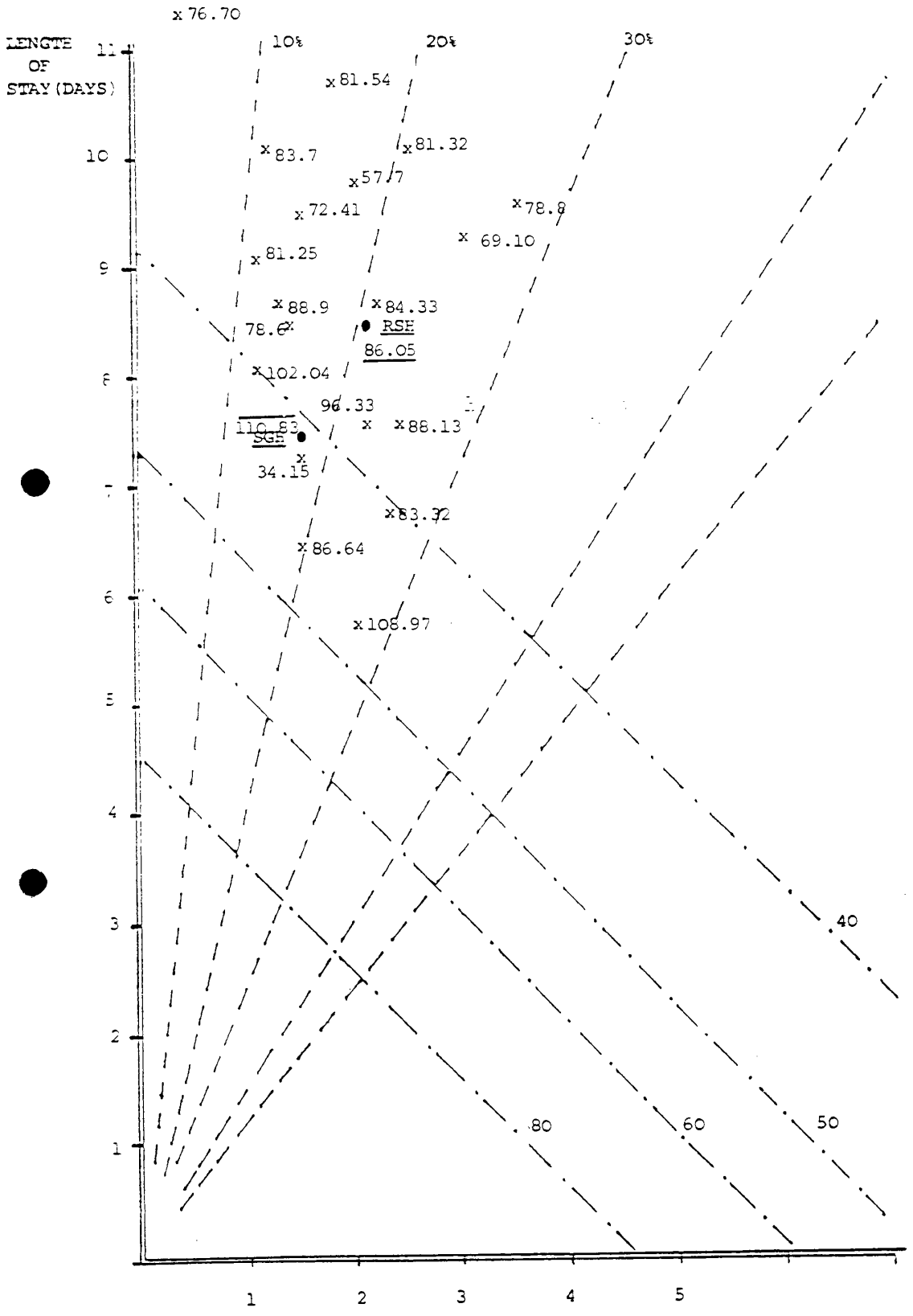

FIGURE 3.3 PROVINCIAL TEACHING HOSPITALS (ENGLAND AND WALES): COST PER INPATIENT DAY 1981/82

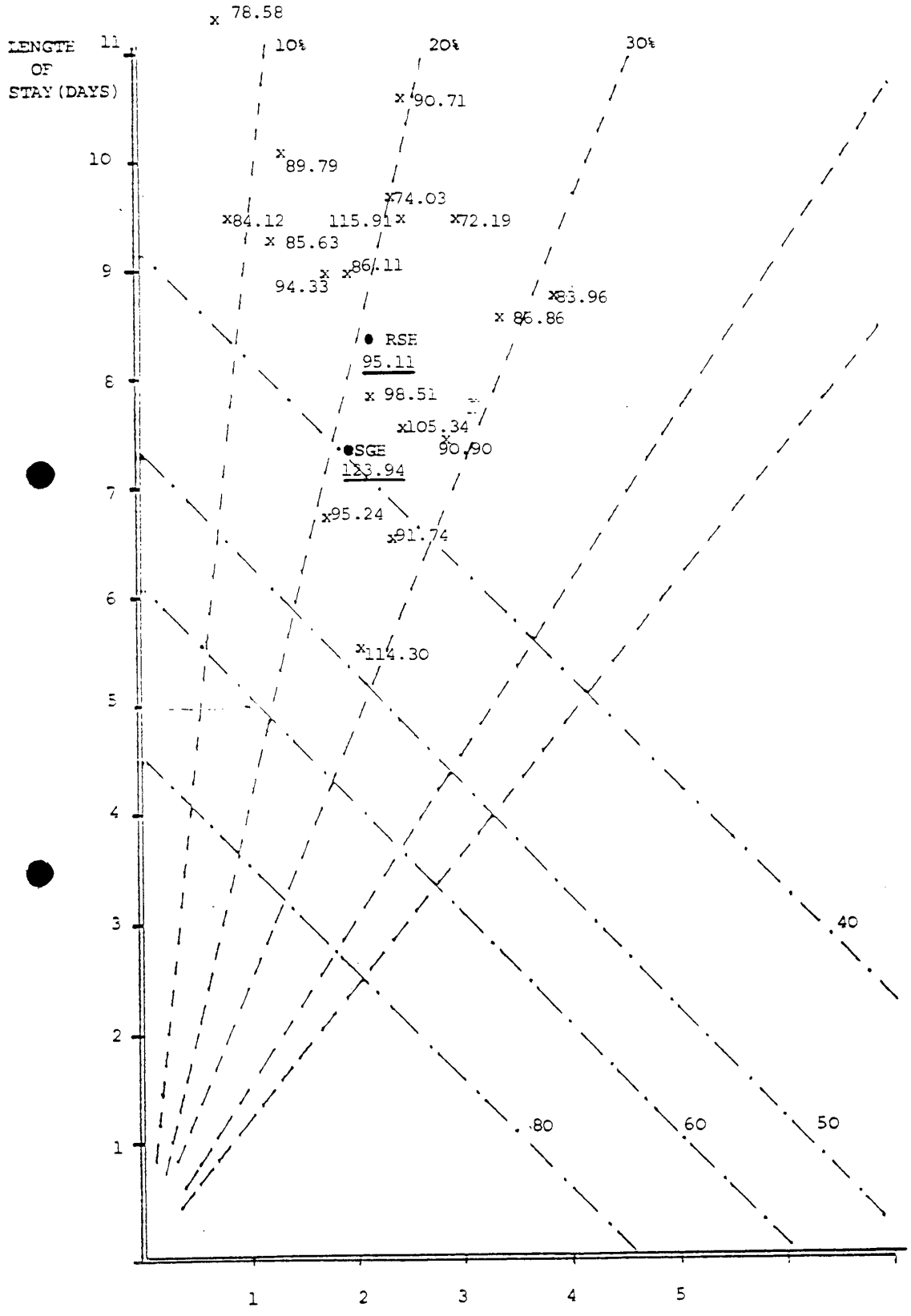

FIGURE 3.4 PROVINCIAL TEACHING HOSPITALS (ENGLAND AND WALES): COST PER INPATIENT DAY 1982/83

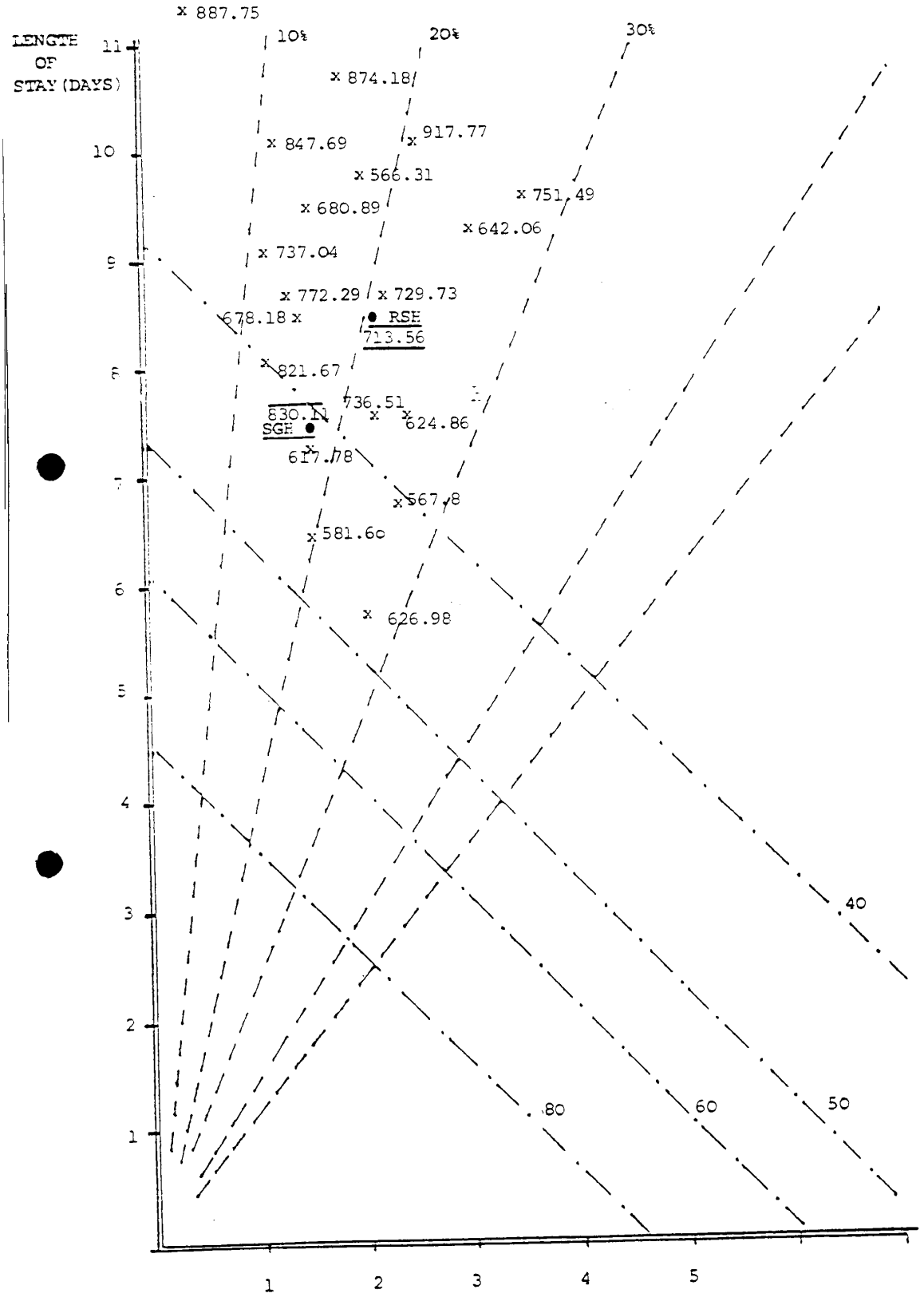

FIGURE 3.5 PROVINCIAL TEACHING HOSPITALS (ENGLAND AND WALES): COST PER INPATIENT CASE 1981/82

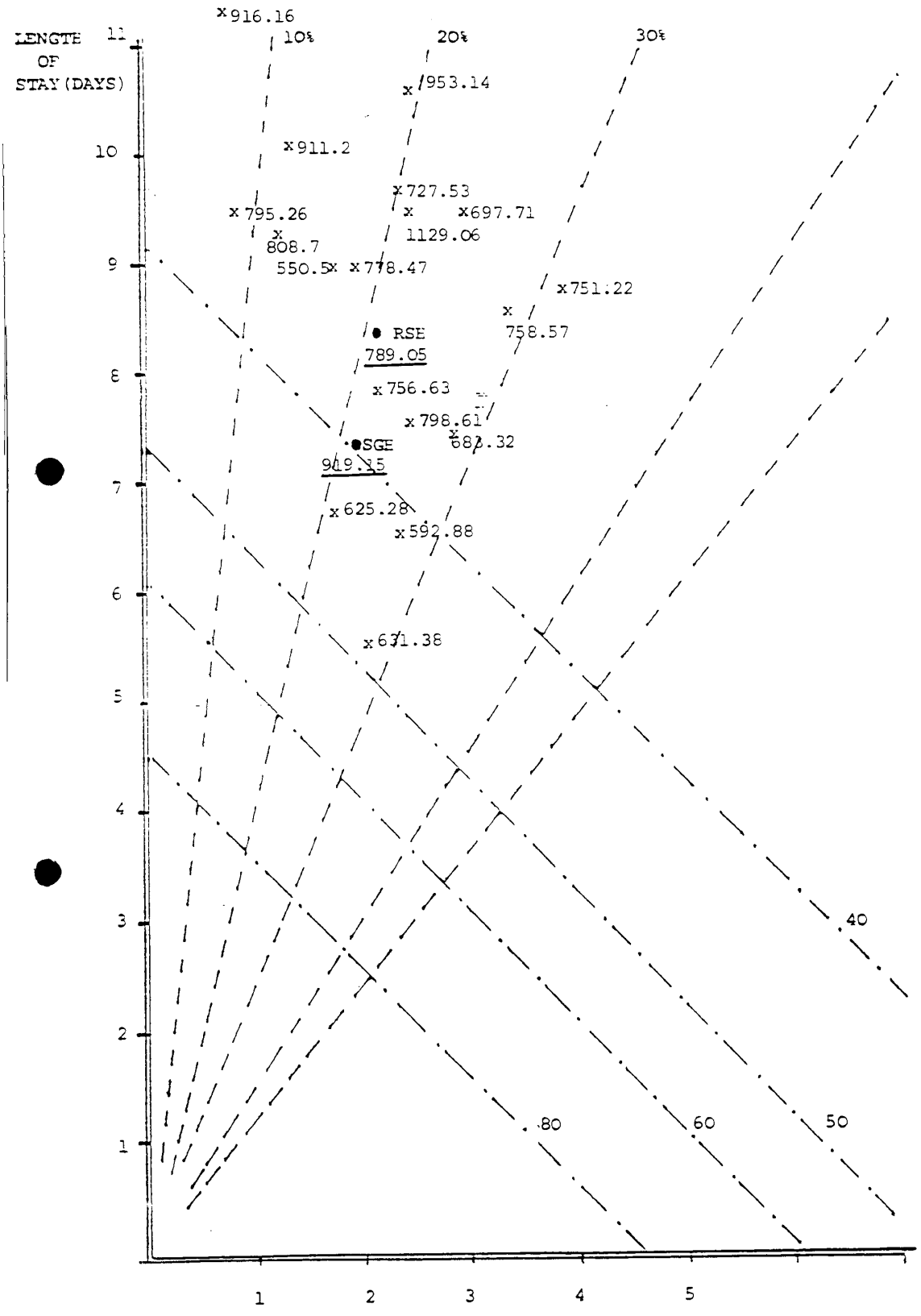

FIGURE 3.6 PROVINCIAL TEACHING HOSPITALS (ENGLAND AND WALES): COST PER INPATIENT CASE 1982/83

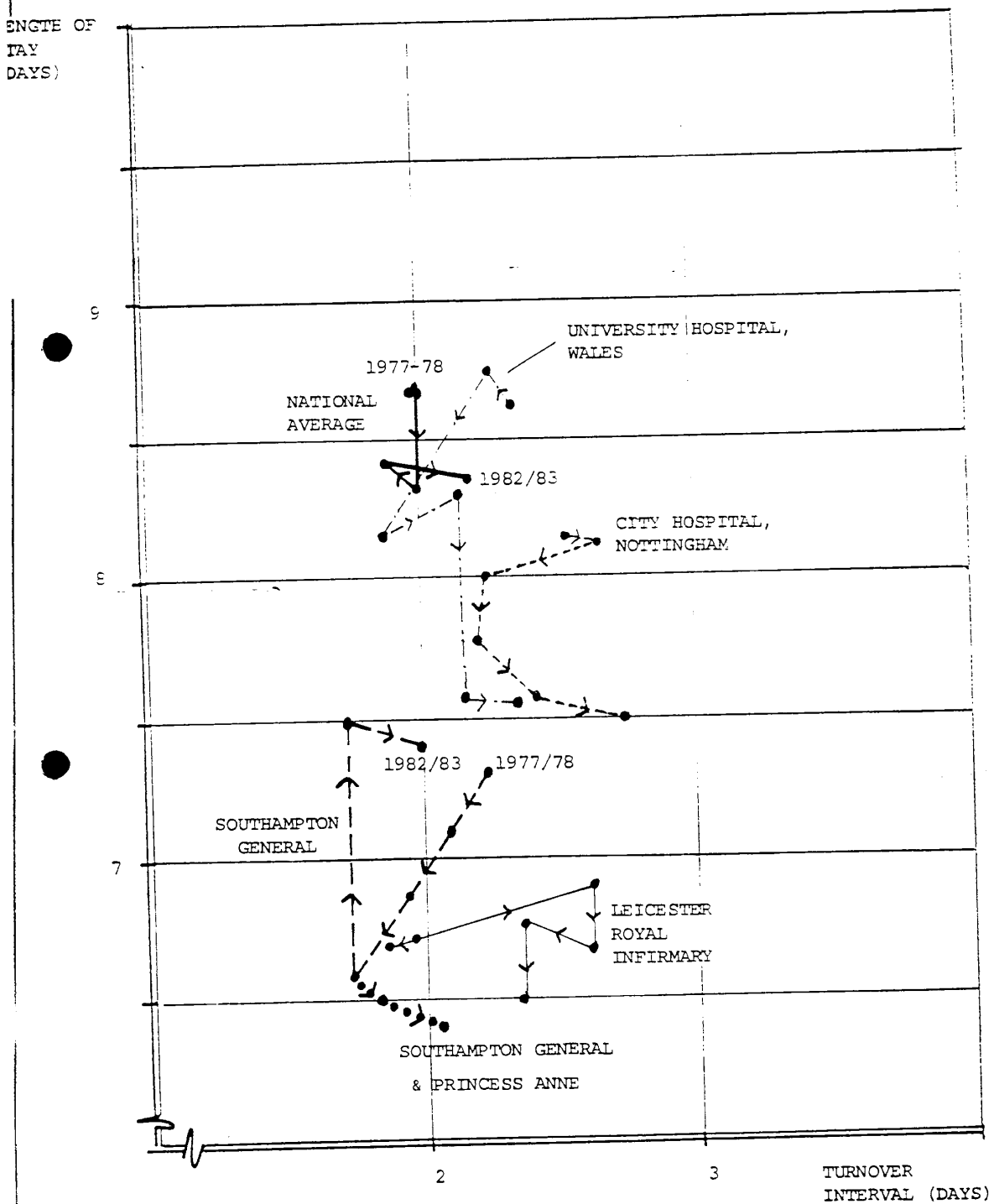

FIGURE 3.7 TRENDS IN BED UTILISATION:
SELECTED PROVINCIAL TEACHING HOSPITALS

1977 - 1983

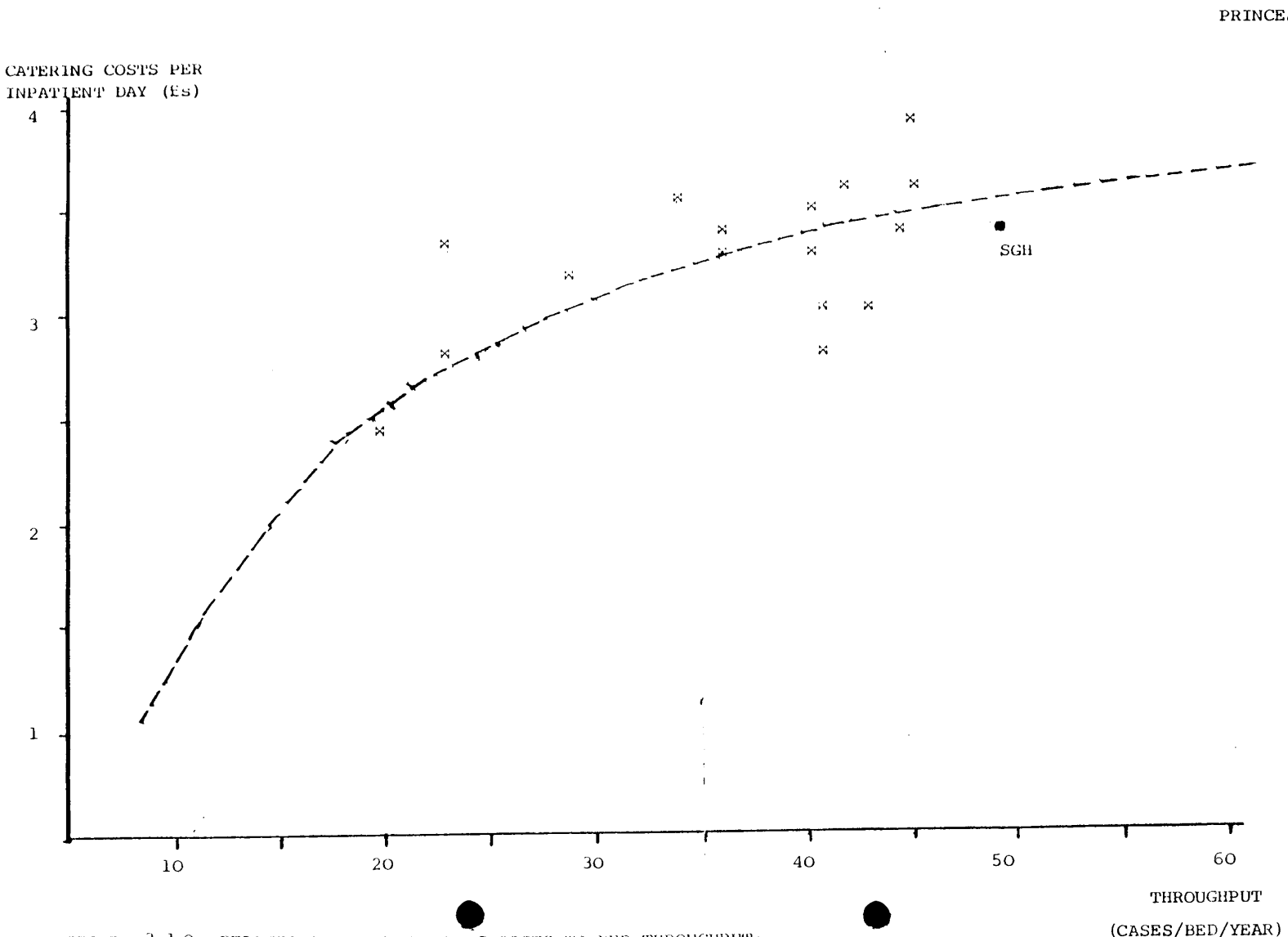

FIGURE 3.1 0 RELATIONSHIP OF CATERING COSTS TO BED THROUGHPUT:

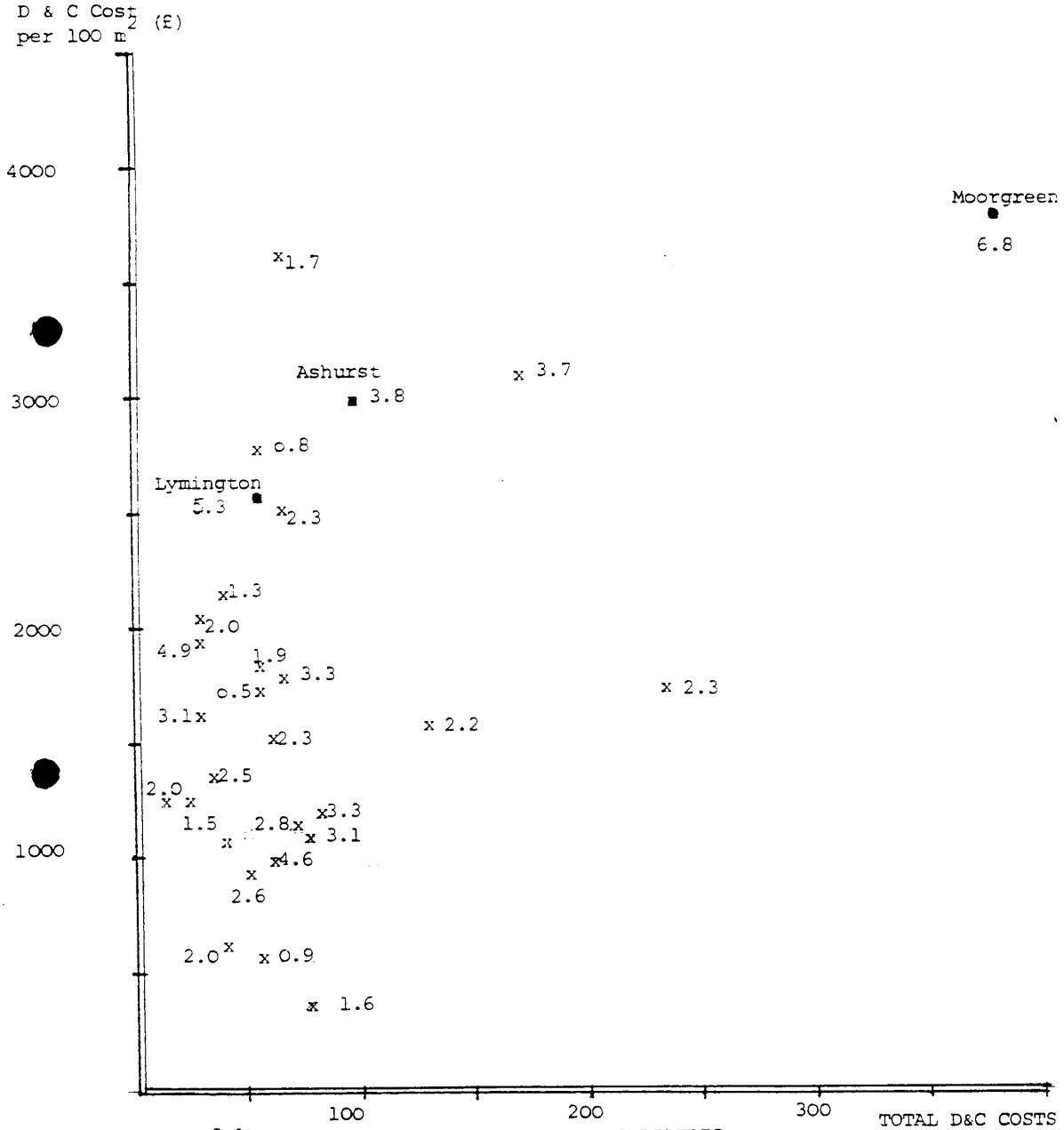

FIGURE 3.11 DOMESTIC AND CLEANING COSTS: GERIATRIC AND LONG STAY HOSPITALS - WESSEX REGION 1981/82 (CASES PER BED PER YEAR IN BRACKETS)

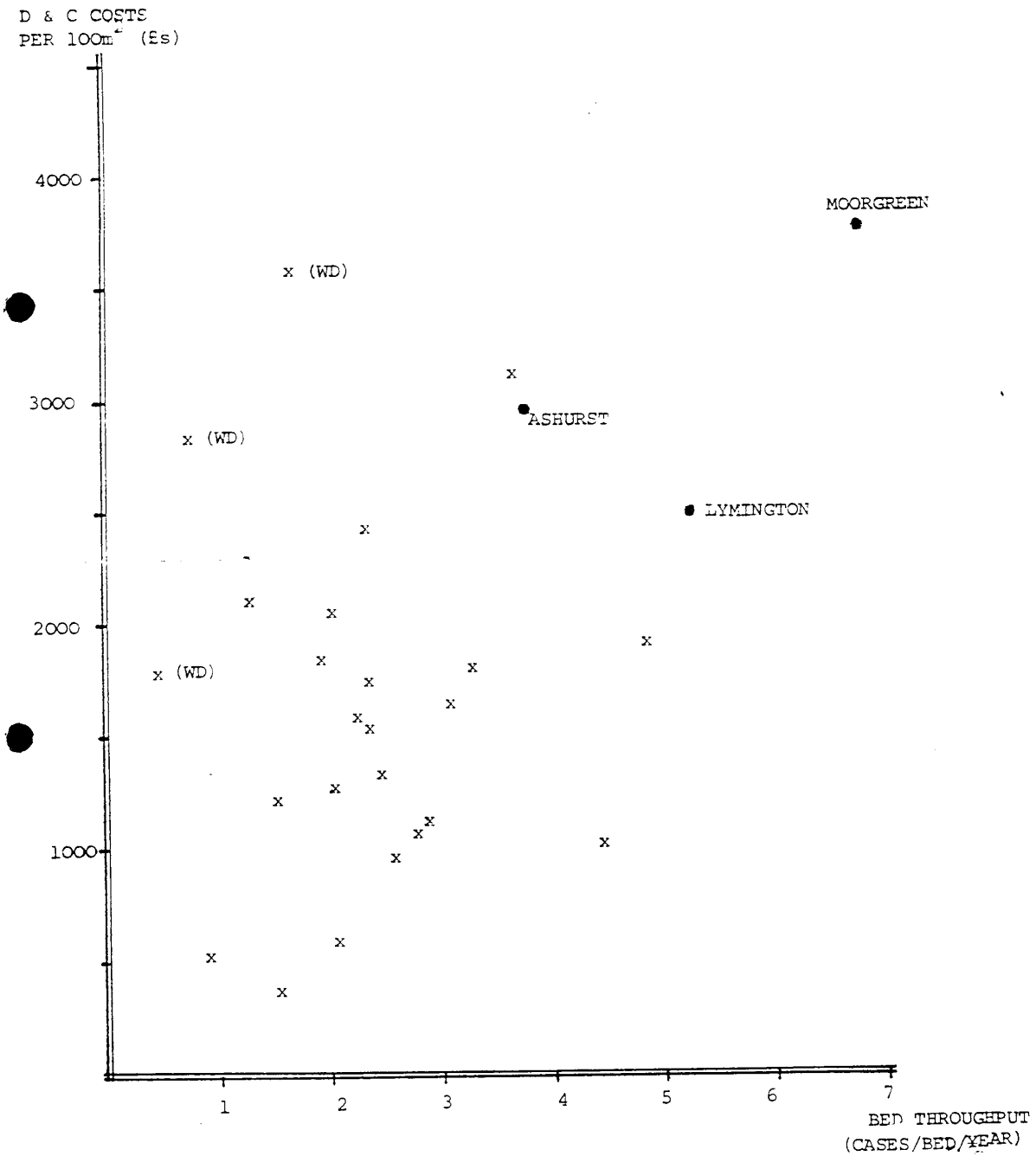

FIGURE 3.12 RELATIONSHIP OF DOMESTIC AND CLEANING COST TO BED USE: GERIATRIC AND LONG-STAY HOSPITALS - WESSEX REGION 1981/82

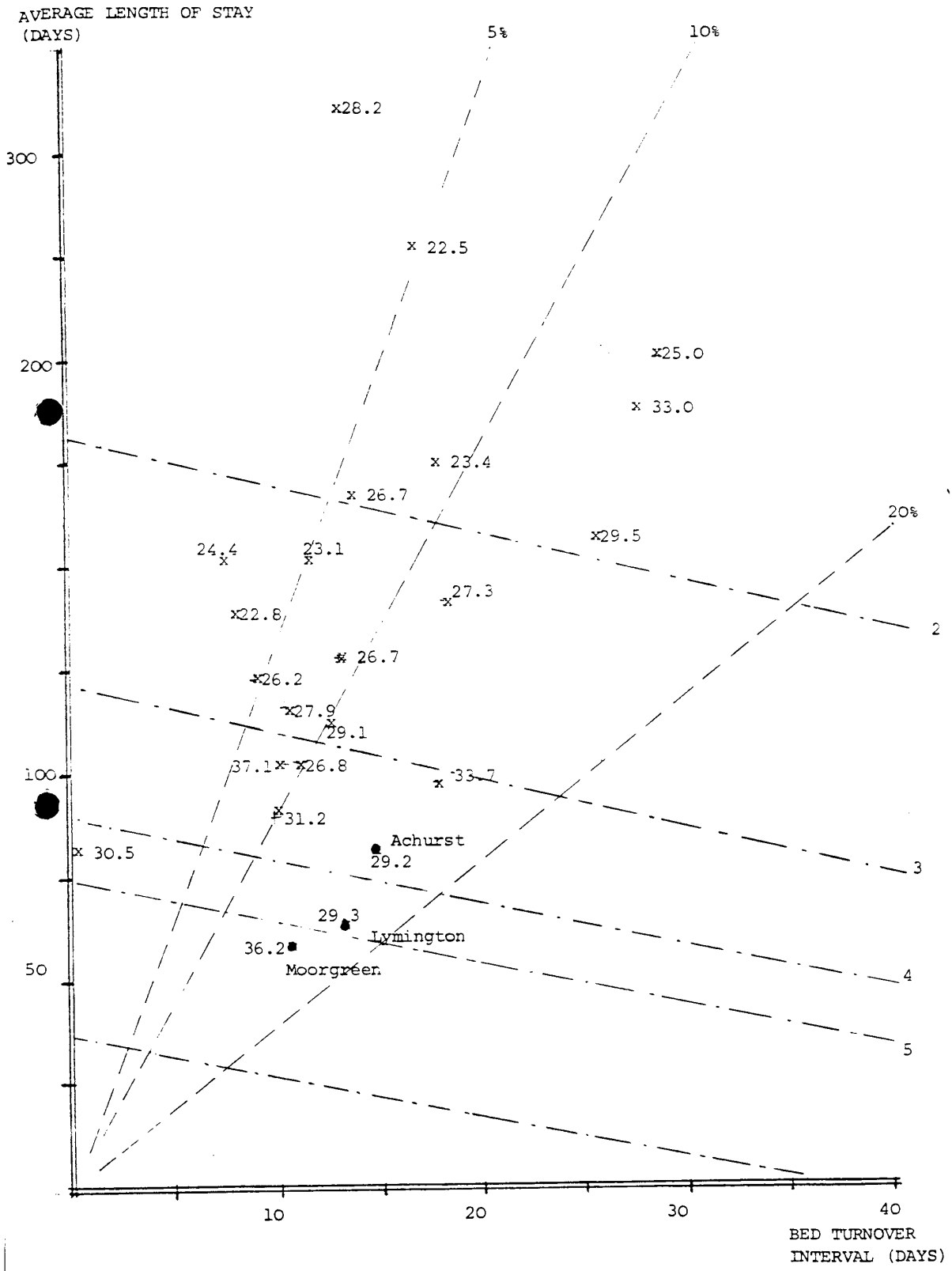

FIGURE 3.13 COST PER INPATIENT DAY: GERIATRIC AND LONG STAY HOSPITALS - WESSEX REGION 1981/82

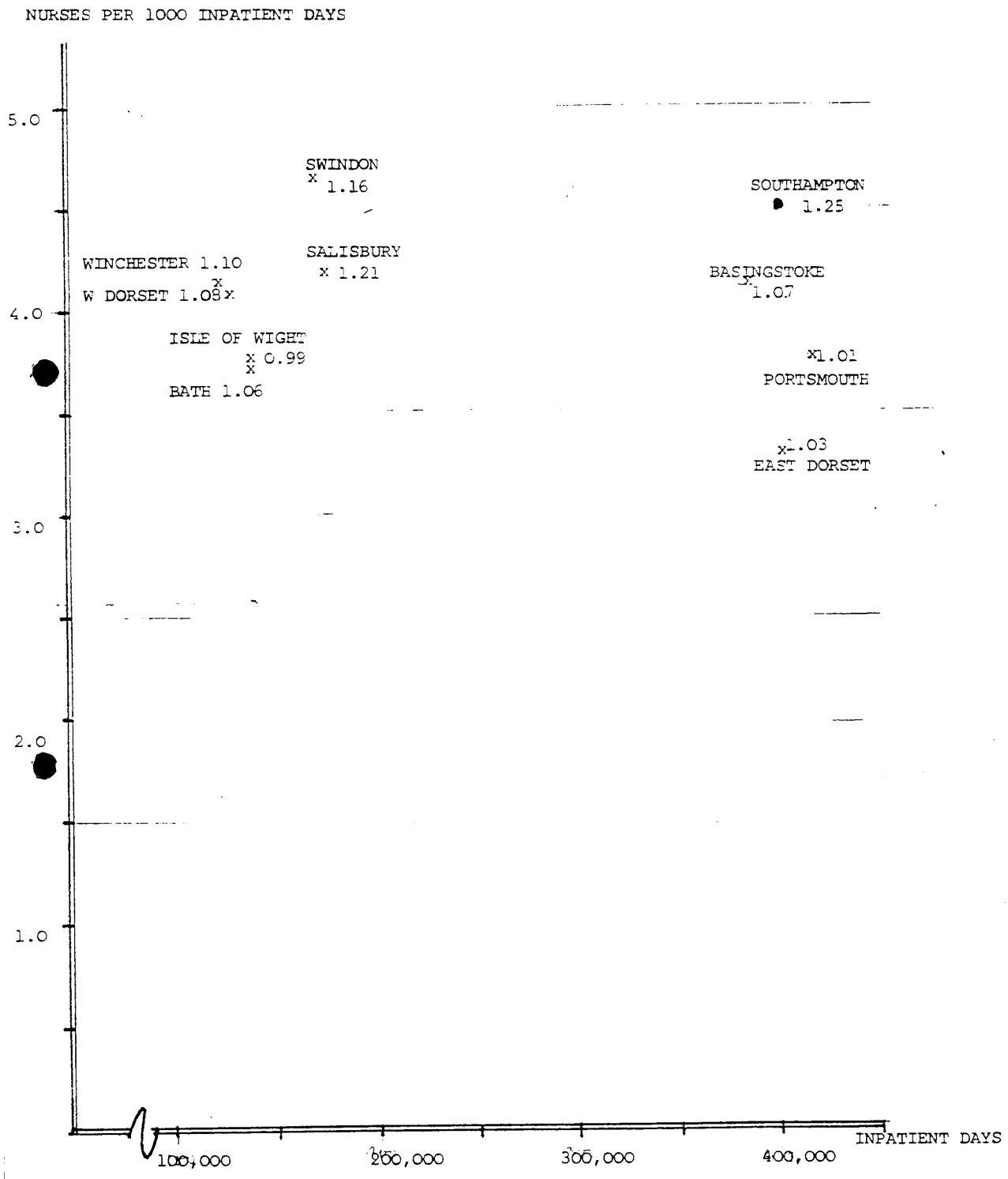

FIGURE 3.1 4 RELATIONSHIP OF NURSE STAFFING LEVELS TO ACUTE INPATIENT WORKLOAD - WESSEX HEALTH DISTRICTS, 1981/82 (NURSES PER ACUTE BED IN BRACKETS)

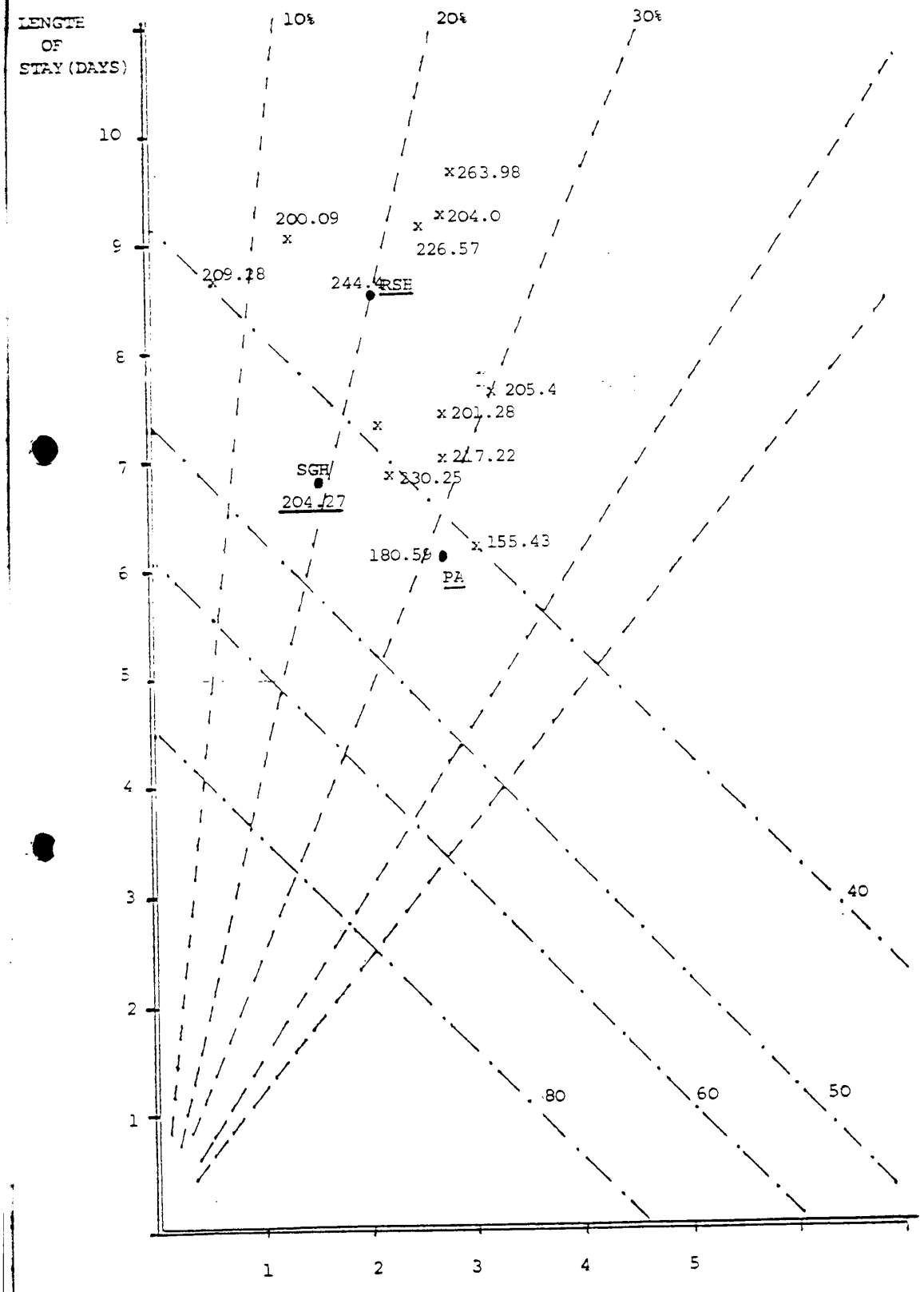

FIGURE 3.1.5 NURSING COST PER INPATIENT CASE: ACUTE HOSPITALS (CATEGORY A)

WESSEX REGION 1981/82

TABLE 1

Information for 6 year Barber journals.

		77/78	78/79	79/80	80/81	81/82	82/83	
		10.7 (81%)					10.4 (80%)	
onal.	Turnover	2·0	2·0	2·0	2·0	1·9	2·1	
	LOS	8·7	8·7	8·7	8·3	8·4	8·3	
	cost/case	377·0	427·2	523·76	640·16	708·61	769·43	
7·9		100	102·78	103·97	101·77	104·62	104·98	8·3 →
	cost/day	43·444	49·32	59·96	76·82	84·76	92·52	
		100	102·92	103·30	105·39	108·40	109·56	
Southampton	Turnover	9·5 (77%) 2·2	2·1	2·0	1·7	1·7	9.4 (79%) 2·0	
General	LOS	7·3	7·1	6·9	6·6	7·5	7·4	
	cost/case	372·72	424·07	502·82	601·55	830·11	919·15	
7·3		100	103·2	100·96	96·18	123·73	128·40	7·4 ↗
	cost/day	51·35	59·96	72·77	91·21	110·83	123·94	
		100	105·91	104·05	105·85	119·91	124·16	
iversity Wales	Turnover	2·4	2·3	1·8	2·1	2·2	2·4	
	LOS	8·7	8·8	8·1	8·3	7·6	7·6	
	cost/case	417·48	471·98	497·94	658·05	736·51	798·61	
8·7		100	102·54	89·26	93·94	98·01	98·40	7·6 →
	cost/day	48·02	53·79	61·35	79·75	96·33	105·34	
		100	101·80	95·61	98·97	114·45	112·84	
ity Hospital	Turnover	2·6	2·7	2·3	2·3	2·4	2·8	
ottingham.	LOS	8·1	8·1	8·0	7·8	7·6	7·5	
	cost/case	341·27	384·39	449·85	591·05	627·86	683·32	
		100	102·10	98·65	103·21	102·21	103·00	→
	cost/day	42·06	47·46	56·22	75·35	83·13	90·90	
		100	102·35	100·03	106·97	109·81	111·17	
John Radcliffe.	Turnover	1·8	1·6	–	1·5	1·6	1·7	
	LOS	6·6	6·8	–	6·7	6·5	6·6	
	cost/case	348·87	396·43	–	503·91	561·60	625·28	
		100	103·07	–	86·08	89·63	92·18	↘
	cost/day	52·87	58·35	–	75·46	86·64	95·24	
					85·01	91·04	92·46	

Information for 6 year Barbee planners

		77/78	78/79	79/80	80/81	81/82	82/83	
Leeds Royal								
	Turnover	1·9	1·8	2·7	2·7	2·4	2·4	
	LOS	6·7	6·7	6·9	6·7	6·8	6·5	
	cost/case	290·78	369·42	416·56	525·63	567·30	592·88	
		100	115·23	107·21	107·73	108·39	104·88	→
	cost/day	43·41	55·04	60·15	78·90	83·32	91·74	
		100	115·00	103·70	108·32	106·63	108·71	
Royal Victoria Newcastle	Turnover	1·6	1·8	1·6	1·9	1·6	2·1	
	LOS	7·8	7·7	7·6	7·4	7·3	7·7	
	cost/case	327·12	371·99	450·24	569·95	617·72	756·63	
		100	103·14	103·00	103·83	104·90	118·98	↗
	cost/day	41·82	48·48	59·20	72·06	84·15	98·51	
		100·00	105·15	105·94	109·81	111·79	121·17	
Combined SCH Princess Anne.	Turnover	2-2	2-1	2-0	1-7	1·8	2·05	
	LOS.	7-3	7-1	6-9	6-6	6·5	6·4	
	cost/case	372-72	426-07	502-82	601·55	654·45	729·54	
		100	103·20	100·96	96·18	97·55	100·69	→
	cost/day	51-35	59-96	72-77	91-21	100·19	113·75	
		100	105·91	106·65	105·85	108·39	113·95	
INDEXANKS USED	Turnover							
	LOS							
	cost/case	100	110·25	133·62	167·88	180·00	194·40	
	cost/day							
	Turnover							
	LOS							
	cost/case							
	cost/							

TABLE 2

Ranking of Southampton General Hospital compared with other provincial Teaching Hospitals - years 1977/78 - 1982/83

No. of provincial teaching hosps.	Cost per i/p day						Cost per i/p case					
	20	18	20	22	21	20	20	18	20	22	21	20
Patient Care Services	77/78	78/79	79/80	80/81	81/82	82/83	77/78	78/79	79/80	80/81	81/82	82/83
Direct Treatment Services and Supplies												
Medical Staff	4	1	1	2	1	1	9	4	5	11	5	2
Dental Staff			–	–	–	12			–	–	–	13
Nursing Staff	3	1	1	6	5	4	11	10	11	20	10	9
MSSE	9	6	4	3	2	3	14	12	11	8	3	3
Pharmacy		8	9	8	6	4		14	16	14	9	7
Misc. treatment services			9	9	10	8			11	11	9	8
SUB TOTAL.	3	2	2	1	1	1	13	8	12	17	5	4
Diagnostic Departments												
Radiology	16	17	12	21	7	3	18	17	16	21	11	4
Pathology (sub total)	18	17	20	15	16	18	20	17	20	19	15	20
Electroencephalography	5	5	4	3	2	3	6	6	4	3	2	4
Electrocardiography			18	21	20	20			19=	21	21	20
Medical physics			10	3	1	1			11	7	2	1
Nuclear Medicine			1	1	1	1			1	2	2	1
Audiology			–	–	–	–			–	–	–	–
SUB TOTAL	12	15	16	10	5	5	17	17	19	18	9	10
Other Medical and Paramedical Services.												
Radiotherapy	–	–	–	–	–	–	–	–	10	–	–	–
Physiotherapy	5	6	7	9	3	2	15	11	13	17	7	5
Speech Therapy			–	–	–	–			–	–	–	–
Optical Services			–	–	–	–			5	–	–	–
Psychology			–	–	–	–			–	–	–	–
Dental Surgery.			2	1	1	–			3	2	1	–

	cost per i/p day						cost per i/p case					
Cost Provincial Teach Hosp.	20	18	20	22	21	20	20	18	20	22	21	20
Patient Care Services	77/78	78/79	79/80	80/81	81/82	82/83	77/78	78/79	79/80	80/81	81/82	82/83
Social Work			-	-	-	1			-	-	-	1
Occupational Therapy	15	12	17	17	18	13			14	19	18	16
Industrial Therapy			-	-	-	-	17	15	-	-	-	-
Medical photography			12	12	14				13	13	14	12
Medical Illustration			-	-	-	-			-	-	-	-
Chiropody			1	-	-	-			1	-	-	-
Misc. paramed.			8	22	16	8			13	21	17	10
SUB TOTAL	15	12	15	14	8	7	18	14	17	19	10	13
GENERAL SERVICES												
Patient Related												
Catering – patients	4*	4*	1*	5	4	2	14*	10*	3*	17	13	11
Laundry	15	12	16	17	16	14	16	16	16	19	17	16
Linen	6	3	3	4	2	1	10	9	8	6	2	2
Non patient Related												
Administration	2	1	7	12	3	2	5	2	15	18	2	2
Medical Records	17	12	14	4	6	5	19	14	16	7	6	5
Training & Education	7	6	10	4	5	6	8	6	11	7	9	7
Catering – Staff	-	-	-	12	1	2	-	-	-	13	2	4
Domestic / cleaning	4	1	3	4	3	3	13	7	10	13	6	4
Portering	2	2	1	2	1	1	7	5	4	6	1	1
Transport	2	2	3	1	1	1	5	3	3	1	1	1
Estate Management:												
Eng. maintenance			2	1	1	2			4	5	2	2
Energy and Utility			3	3	3	2			6	7	4	2
Building maintenance	1	1	8	11	9	8	3	4	16	17	11	10
Grounds and gardens			4	19	11	5			8	20	11	8
General estate expenses			3	13	3	3			3	17	4	3
Misc. Services & expenses	20	18	20	22	1	1	20	18	20	22	1	1
SUB TOTAL.	1	1	2	2	2	1	7	9	12	12	1	2

* Total catering

o of	Cost per i/p day						Cost per i/p case					
incial Teaching hosps	20	18	20	22	21	20	20	18	20	22	21	20
ient Care Services	77/78	78/79	79/80	80/81	81/82	82/83	77/78	78/79	79/80	80/81	81/82	82/83
GROSS TOTAL	3	1	2	2	1	1	12	9	13	16	4	3
neral Services Credit	1	2	3	6	3	2	5	7	9	9	2	1
NET TOTAL	3	1	2	2	1	1	12	9	13	16	5	3

C.

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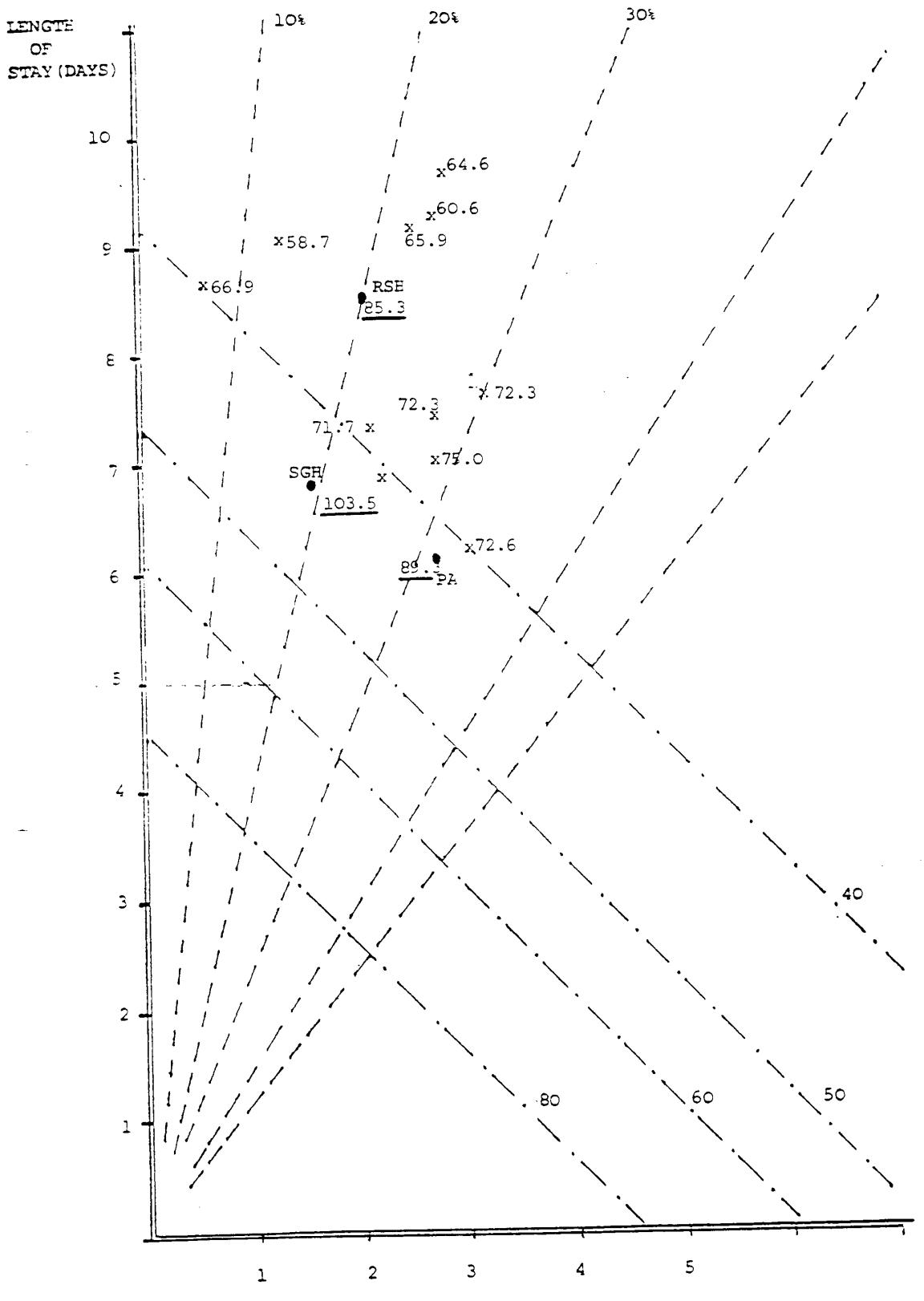

FIGURE 3.8 COST PER PATIENT DAY: ACUTE HOSPITALS (CATEGORY A) WESSEX REGION 1981/82

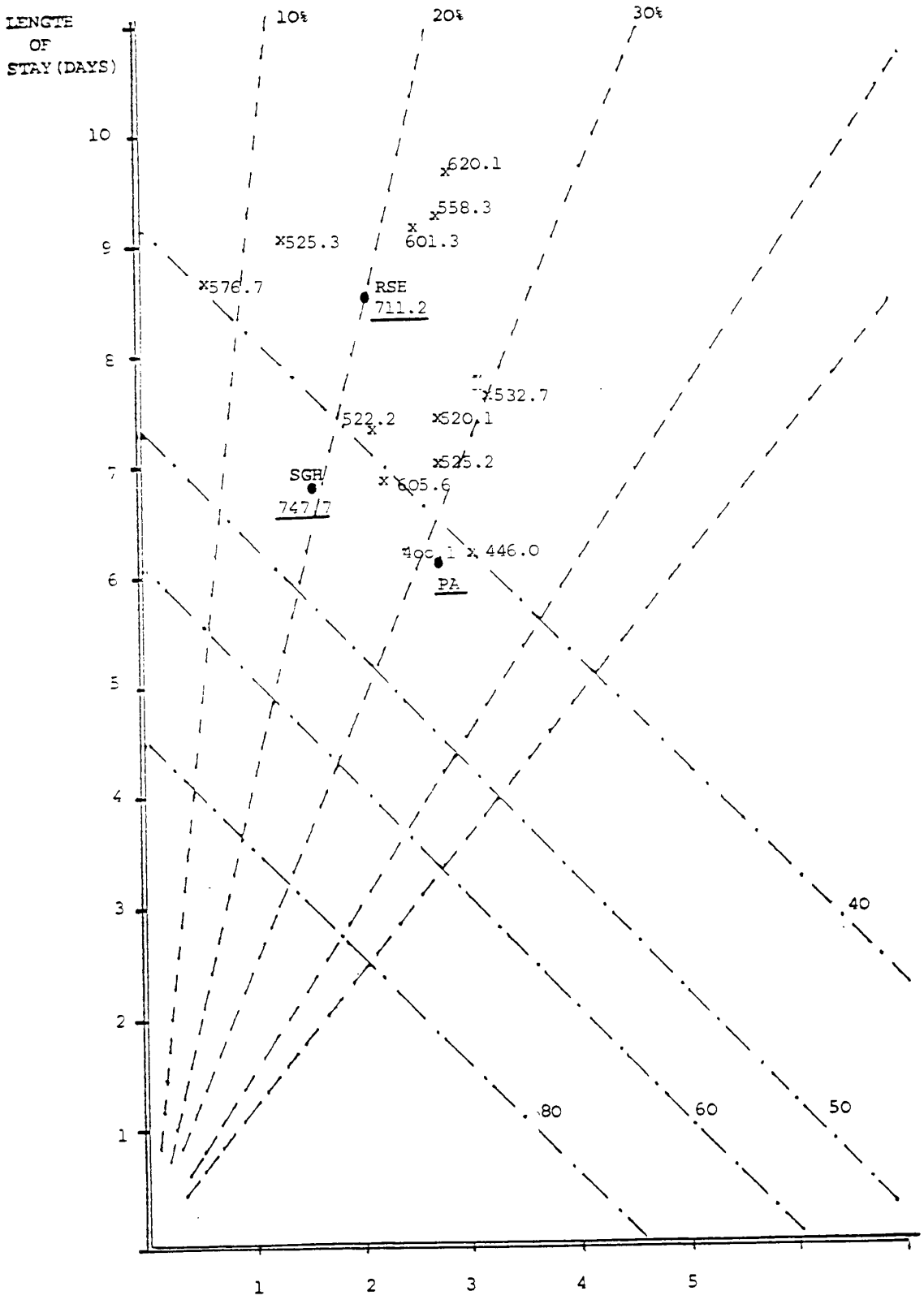

FIGURE 3.9 COST PER INPATIENT CASE: ACUTE HOSPITALS (CATEGORY A) WESSEX REGION 1981/82