The impact of supervision on stock management and adherence to treatment guidelines: a randomized controlled trial

BIRNA TRAP, CHARLES H TODD, HEATHER MOORE AND RICHARD LAING

1Department of Social Pharmacy, The Royal School of Pharmacy, Denmark, 2University of Zimbabwe Medical School, Harare, Zimbabwe, 3Zimbabwe Essential Drugs’ Action Programme, Ministry of Health and Child Welfare, Zimbabwe and 4Boston University School of Public Health, Boston, MA, USA

Ensuring the availability of essential drugs and using them appropriately are crucial if limited resources for health care are to be used optimally. While training of health workers throughout Zimbabwe in drug management (including stock management and rational drug use) resulted in significant improvements in a variety of drug use indicators, these achievements could not be sustained, and a new strategy was introduced based on the supervision of primary health care providers. This was launched in 1995 with a training course in supervisory skills for district pharmacy staff.

In order to evaluate the impact of the supervision and the effectiveness of the training programme, adherence to standard treatment guidelines (STG) and stock management protocols was evaluated in a randomized controlled trial. The study compared three different groups of health facilities: those that received supervision for either use of STG (n = 23) or stock management (n = 21) – each facility acting as control for the other area of supervision – and a comparison group of facilities which received no supervision (n = 18). On-the-spot supervision by a specially trained pharmacy staff, based around identified deficiencies, took place at the start of the study and 3 months later. The evaluation compared performance on a variety of drug management indicators at baseline and 6–8 months after the second supervisory visit.

The results of the study showed that, following supervision, overall stock management improved significantly when compared with the control and comparison groups. Similar improvements were demonstrated for adherence to STG, although the effect was confounded by other interventions. The study also showed that supervision has a positive effect on improving performance in areas other than those supervised, and demonstrated that pharmacy technicians with limited clinical skills can be trained to influence primary health care workers to positively improve prescribing practices.

Allocating resources to supervision is likely to result in improved performance of health workers with regard to the rational use of essential drugs, resulting in improved efficiency and effectiveness.

Introduction

Very limited funds are available for expenditure on drugs in the public health sector in most African countries. For example, in Zimbabwe during the 1994–95 fiscal year, about US$5 was spent in the public sector on drugs and supplies per person. Ensuring the optimal use of these limited funds is one of the major challenges facing health managers. The study described in this paper aimed to evaluate the impact of supervision undertaken by trained drug management supervisors on two crucial aspects of drug management at primary health care facilities: the implementation of stock management systems and adherence to standard treatment guidelines (STG).

Background

The healthcare delivery system in Zimbabwe has four levels: health centres or clinics at primary level, supported by district hospitals, provincial hospitals and finally central referral hospitals, which are located in the two major cities. Health services in the districts are coordinated by the district health executive. This is chaired by the district medical officer and includes the pharmacy manager, who is occasionally a pharmacist but in most cases a pharmacy technician. Each district has between five and 45 rural health centres or clinics (RHC) supported by the district hospital. One or two trained nurses and nurse aids undertake activities at the RHC, including prescribing and drug management. The role of the district pharmacy manager is related to implementation of the national stock management system, ensuring adherence to standard
treatment guidelines, and control of the budget for drugs and medical supplies at the hospital and RHCs.

The national stock management system relies on the use of stock cards and stock books to allow accurate recording of monthly consumption information in order to calculate a minimum stock figure, based on 3 months’ consumption. This figure is the basis of the stock management system and is the re-order level as well as the re-order quantity. To implement this system, intensive training activities, aimed at more than 5000 health workers, were carried out, with district level workshops held countrywide during the period 1986-1992. All facilities were provided with guidelines and manuals on stock management, and copies of the Zimbabwe Essential Drug List (EDLIZ), which includes standard treatment guidelines for common conditions (Laing and Ruredzo 1994).

Zimbabwe Essential Drugs’ Action Programme (ZEDAP)

ZEDAP was established in 1986 with the aim of ensuring that good quality drugs are available, accessible, affordable and put to appropriate use. A major part of the early ZEDAP programme was devoted to training related to stock management and improving drug use (Laing and Ruredzo 1994).

ZEDAP surveys have examined the implementation of the stock management system and rational drug use by evaluating indicators related to correct use of the stock management tools and STG (Trap et al. 1997). The results of these surveys have indicated that while the training resulted in improvements in both stock management and adherence to STG, the achievements were not sustained. For example, the use of the stock management book increased from 28% in 1989 to 74% in 1991, thereafter reducing steadily until 1995, when only 45% of health facilities were using it (Trap et al. 1996). It therefore became evident that stock management changes related to behaviour (use of the stock management system) and knowledge (correct use of the system) achieved in 1989 were not sustained after 1991, and that stock management was no longer satisfactorily implemented at rural health facility level.

In the area of adherence to STG, impressive achievements were made in generic prescribing, decreased number of drugs per prescription, no increase in use of injections and increased adherence to STG (Trap et al. 1997). However, overall these results were also not sustained. The number of drugs per prescription increased from 1.3 in 1991 to 1.7 in 1995, and adherence to STG for diarrhoea without blood, acute respiratory infection (ARI) and urethral discharge in men all decreased over the same period (Ministry of Health and Child Welfare data).

Based on these findings, the need for a new strategy for achieving sustainable improvements in stock management and adherence to STG was identified. Without a well functioning stock management system, ensuring drug availability and the correct use of these drugs, the community’s trust and the quality of care would be adversely affected, and the limited resources available for drugs and supplies would be wasted.

Supervision as an intervention

Face-to-face education has been found to be as effective as seminars and workshops in improving the level of knowledge of health workers (Ofori-Adjei and Arhinful 1996; Santoso et al. 1996), but has a greater impact on behavioural change (Kafuko 1984; Braybrook and Walker 1996; Ross-Degnan et al. 1997). When follow-up reinforcement visits were undertaken the impact was found to increase (Soumerai et al. 1989). These findings indicate the likely benefit of establishing a system that provides for regular, on-site supervisory visits. Several studies have confirmed that supervision has contributed to improvements in rational drug use (Soumerai et al. 1989; Levenson et al. 1995; Kaffe et al. 1997). Furthermore, supervision has been found to increase the supervised nurses’ job satisfaction, whereby the nurses felt more confirmed in their work and more satisfied (Beget et al. 1997). Other studies, however, have pointed towards difficulties in achieving the desired changes if there are strong social and cultural influences (Ofori-Adjei and Arhinful 1996); the results may also be influenced by various factors such as the gender, age, seniority and educational background of the supervisor (Soumerai et al. 1989). The impact of supervision is also likely to depend on its different characteristics, such as the duration of training, quality of educational material, expertise of trainers, training context, level of trainees and degree of follow up (Le Grand et al. 1999).

Various authors have concluded that the best effect occurs when combining strategies (Quick et al. 1991). In Zimbabwe a combined strategy was applied with the use of checklists and guidelines, clinical guidelines and stock management modules combined with an educational strategy. The importance of familiarizing the pharmacist with the practices of supervision has been found to lead to better results, enhanced productivity and higher morale, and to create a better practical environment (Wick 1998).

Drug management supervisors’ programme

In view of the importance of drugs and the experiences from other countries, ZEDAP decided to develop a special training programme for drug management supervisors. A national drug management supervisory programme was established under the auspices of the Department of Pharmacy Services of the Ministry of Health and Child Welfare. This focused on supervision in all drug-related matters, and provided regular feedback to programme managers, policy-makers and district health teams.

Pharmacists or pharmacy technicians from every province attended a 2-week national training course. The course emphasized the development of appropriate communication skills, and revisited the principles related to implementation of the stock management system, the use of STG, the essential drugs concept, national drug policy, organization of supervision, use of checklists, report writing and interpretation of indicator studies. The supervision training employed a practical approach with role-plays and field visits to health
facilities. The course was concluded with an examination and preparation of a plan of action. It was followed by a period of fieldwork, with a visit by one of the course facilitators. After the fieldwork, a 2-day final follow-up course was organized with a focus on identified weak areas of supervisory activities. The first group of supervisors completed this training in late 1995.

At the same time as this supervisory activity was being undertaken, a national training programme on sexually transmitted infections (STI) was being undertaken, funded by the World Bank. As will be seen, this had a confounding effect on the results of the supervisory intervention.

Objective

The study aimed to test, with a controlled design, the impact (measured as actual behaviour change) of supervision undertaken by specially trained pharmacy staff on stock management and adherence to STG in district level peripheral health facilities. The study compared stock management and drug use performance between facilities that received either supervision in one or the other area. The facilities receiving supervision were compared on performance score with other facilities that did not receive any supervision.

Methods

The basic study design was a randomized controlled trial with randomization by health facilities using a balanced block design. Health facilities were randomized to receive interventions in either stock management or adherence to STG (rational drug use). In addition there was an independent comparison group.

Twenty-four facilities were selected to be included in each of the three groups. The facilities were selected from seven out of the eight provinces. The intervention facilities were selected from four provinces where trained supervisors were available and the facilities for comparison from the other three provinces. From the four intervention provinces, eight districts were randomly selected and from these districts 48 intervention facilities were randomly selected. From the other three provinces, 24 comparison facilities were randomly selected from the six districts, although for operational reasons it was only possible to collect data from 18 of these.

The 48 facilities were ranked on the basis of their total score on stock management in the baseline study. They were then paired according to their performance, but independently of province and district; i.e. the two facilities with the lowest position on the overall ranking were paired, and the next two, and so on. Each arm of the pair was then randomly allocated to receive supervision on either stock management or rational drug use. Each member of a pair thus acted as a control for the other health facility in the pairing.

The 18 comparison facilities included in the study had overall performance scores in the same range as the intervention facilities for both stock management and rational drug use. When the pre-intervention scores on both stock management and adherence to STG for the intervention, control and comparison facilities were compared there were no significant differences.

The baseline study was carried out in July 1996, followed 6 months later by supervision, consisting of two visits approximately 3 months apart. The final evaluation took place 6–8 months after the last supervision: the long interval was chosen to assess the sustainability of the intervention.

The overall study design is outlined in Figure 1.

Data collected

Evaluation of adherence to the stock management system was based on a sample of 12 drugs and three medical supplies selected from the essential drug list. Different items were chosen for the baseline and for the post-supervision data collection. The study assessed performance on nine different indicators relating to drug availability, use of stock cards and stock books, calculation of minimum stock and monthly ordering, for the 15 indicator items. Accountability was used as an indicator measuring the correctness of stock records when compared with actual physical stock count.

Data related to implementation of STG were collected from the outpatient register. Four common conditions were chosen: acute respiratory infection, diarrhoea without blood,
urethral discharge in men and genital ulcer disease. For each condition, 30 patients who had presented over the previous 3 months were identified retrospectively using systematic random sampling from the outpatient register, and the details of treatment noted. For each patient, data about diagnosis, drug/s, dose and duration were collected. The central project team assessed each patient’s treatment as to whether or not it was according to the national STG. To be correct, drug, dose and duration for the recorded indication had to be fully in accordance with the national STG. An overall score for adherence to STG was calculated for each facility as the average of the individual scores for the four conditions. The field methods and sample size of 30 patients per facility were based on the standard WHO manual (Hogerzeil 1993; WHO 1993).

Ten supervisors were involved in the study itself: eight pharmacy technicians and two pharmacists. At any given health facility, different individuals carried out the baseline study, the supervision and the final evaluation. All supervisors had been trained in the survey methods and had gained experience from participating in the previous ZEDAP surveys. They were encouraged to be good communicators and to approach problem areas as a helping colleague rather than a ‘controller’. In order to minimize bias in the impact evaluation, the supervisors were interchanged to ensure that facilities were evaluated by a different individual than the one providing supervision.

### Intervention

The intervention was supervision either on stock management or on adherence to STG. At each visit the supervisors initiated discussions with the health facility workers, focusing on deficient areas, as revealed by the baseline survey, and together they agreed on ways to improve the knowledge and performance of the staff. Supervisors were asked not to discuss issues concerning the converse area of interest. The first visit was meant mainly to break the ice and establish a good relationship focusing on a few important areas.

#### Measured outcomes

Approximately 6–8 months after the second supervisory visit, the effect of supervision was evaluated. Data were collected for each performance indicator in the same manner as during the baseline survey. Scores were derived for each individual indicator and a combined score for overall stock management and adherence to STG calculated. These scores were compared with the baseline findings for the same facility (differences before and after), and also compared with performance of the control and comparison groups.

#### Data entry and analysis

Raw data were recorded onto data collection sheets. Percentages were calculated for each performance indicator. Summary data were entered into an Excel version 6 spreadsheet (Microsoft Corp, Seattle, WA). Data analysis was carried out in SPSS (SPSS Inc. Chicago, IL). Since the data were not normally distributed, non-parametric tests were used. The differences between before and after score within each facility were compared using the Wilcoxon matched-pairs test. Differences between before and after scores in the intervention facilities were compared with those in the control and comparison facilities using the Mann–Whitney U-test.

### Results

Twenty-one facilities completed supervision on stock management, 23 on STG and 18 served as comparison facilities. The other facilities were excluded due to staff changes or failure to conduct all the planned visits.

Table 1 shows the impact of supervision on the nine stock management indicators. Median scores before and after supervision in the intervention and control facilities are given alongside the data for the comparison facilities and the results of Wilcoxon matched-pairs analysis. This shows significant improvement in post–supervision visits.

#### Table 1. Impact of supervision on adherence to stock management protocols in the intervention, control and comparison facilities (median score before the intervention, median change and P value from Wilcoxon matched-pairs analysis)

<table>
<thead>
<tr>
<th>SM indicator</th>
<th>Intervention (stock management) % (n = 21)</th>
<th>Control (STG intervention) % (n = 23)</th>
<th>Comparison (no intervention) % (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug availability</td>
<td>Pre 73 ± 17 0.542</td>
<td>Change 80 – 6 0.23</td>
<td>p value 73 – 3 0.636</td>
</tr>
<tr>
<td>Use of stock cards</td>
<td>Pre 80 – 2 0.371</td>
<td>Change 80 – 7 0.161</td>
<td>p value 83.5 – 30 0.001</td>
</tr>
<tr>
<td>Correct use of stock cards</td>
<td>Pre 53 – 7 0.654</td>
<td>Change 67 – 13 0.411</td>
<td>p value 76.5 – 22 0.001</td>
</tr>
<tr>
<td>Physical counts recorded</td>
<td>Pre 47 ± 17 0.620</td>
<td>Change 47 – 3 0.649</td>
<td>p value 37 0 0.518</td>
</tr>
<tr>
<td>Accountability</td>
<td>Pre 60 – 4 0.906</td>
<td>Change 64 – 13 0.826</td>
<td>p value 48 14 0.093</td>
</tr>
<tr>
<td>Correct minimum stock</td>
<td>Pre 21 ± 14 0.622</td>
<td>Change 27 – 6 0.468</td>
<td>p value 29.5 – 14 0.093</td>
</tr>
<tr>
<td>Use of stock book</td>
<td>Pre 67 ± 20 0.614</td>
<td>Change 73 – 1 0.876</td>
<td>p value 60 0 0.576</td>
</tr>
<tr>
<td>Correct use of stock book</td>
<td>Pre 13 ± 38 0.002</td>
<td>Change 7 ± 13 0.23</td>
<td>p value 0 0 0.327</td>
</tr>
<tr>
<td>Correct min stock in book</td>
<td>Pre 53 – 3 0.122</td>
<td>Change 56.5 – 27 0.002</td>
<td>p value 16.5 0 0.248</td>
</tr>
<tr>
<td>Overall score</td>
<td>Pre 56 – 7 0.011</td>
<td>Change 60 – 7 0.004</td>
<td>p value 55 – 7 0.001</td>
</tr>
</tbody>
</table>
shows the pre–post differences of the intervention facilities compared with the control and comparison facilities. This shows that when comparing intervention with control facilities, improvements occurred for all indicators, although only one component indicator and the overall score reached the level of statistical significance. When compared with comparison facilities that did not receive any supervision, the differences reached the level of statistical significance for most indicators. Table 3 compares adherence to STG for the four selected indicator conditions between intervention, control and comparison groups of facilities. This shows significant improvements in pre–post measures for all four indicators in the intervention group. Table 4 shows the impact of supervision on intervention group facilities compared with control and comparison facilities. This shows significant improvements in the treatment of diarrhoea and acute respiratory infections (ARI). The results for the treatment of urethral discharge and genital ulcer disease did not show significant differences in improvement compared with the control facilities. This was probably due to the confounding effect of the national STI training programme mentioned earlier.

Discussion

In this study, we attempt to evaluate the impact of two supervisory visits on the performance of primary health care workers with regard to drug management. Modest but significant improvements were found in both stock management and adherence to STG, when compared with a control group

Table 2. Impact of supervision on adherence to stock management protocols: intervention group vs. control and vs. comparison groups – difference in median change in scores and P value from Mann–Whitney U-test

<table>
<thead>
<tr>
<th>SM indicator</th>
<th>Stock management intervention compared with control (STG intervention)</th>
<th>Stock management intervention compared with comparison (no intervention)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difference (%) p value</td>
<td>Difference (%) p value</td>
</tr>
<tr>
<td>Drug availability</td>
<td>+13 0.284</td>
<td>+10 0.443</td>
</tr>
<tr>
<td>Use of stock cards</td>
<td>+5 0.51</td>
<td>+28 &lt;0.001</td>
</tr>
<tr>
<td>Correct use of stock cards</td>
<td>+20 0.312</td>
<td>+29 0.001</td>
</tr>
<tr>
<td>Physical counts recorded</td>
<td>+20 0.063</td>
<td>+17 0.032</td>
</tr>
<tr>
<td>Accountability</td>
<td>+9 0.196</td>
<td>+10 0.026</td>
</tr>
<tr>
<td>Correct minimum stock</td>
<td>+20 0.023</td>
<td>+28.5 0.004</td>
</tr>
<tr>
<td>Use of stock book</td>
<td>+19 0.056</td>
<td>+20 0.020</td>
</tr>
<tr>
<td>Correct use of stock book</td>
<td>+25 0.138</td>
<td>+38 0.049</td>
</tr>
<tr>
<td>Correct min stock in book</td>
<td>+24 0.273</td>
<td>–3 0.878</td>
</tr>
<tr>
<td>Overall score</td>
<td>+14 &lt;0.001</td>
<td>+14 &lt;0.001</td>
</tr>
</tbody>
</table>

Table 3. Impact of supervision on adherence to standard treatment guidelines in the intervention, control and comparison facilities (median score before the intervention, median change and P value from Wilcoxon matched-pairs analysis)

<table>
<thead>
<tr>
<th>Indicator condition</th>
<th>Intervention % (n = 23)</th>
<th>Control (stock management intervention) % (n = 21)</th>
<th>Comparison (no intervention) % (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre Change p value</td>
<td>Pre Change p value</td>
<td>Pre Change p value</td>
</tr>
<tr>
<td>Diarrhoea without blood</td>
<td>46 31 &lt;0.001</td>
<td>73 0 0.57</td>
<td>59.5 –6 0.017</td>
</tr>
<tr>
<td>Acute respiratory infection</td>
<td>85 7 0.024</td>
<td>90 0 0.6</td>
<td>93 –10 0.024</td>
</tr>
<tr>
<td>Urethral discharge</td>
<td>47 26 0.031</td>
<td>30 27 0.144</td>
<td>56.5 –6.5 0.77</td>
</tr>
<tr>
<td>Genital ulcer disease</td>
<td>40 19.5 0.004</td>
<td>36.5 +25.5 0.022</td>
<td>57 +4 0.3</td>
</tr>
<tr>
<td>Overall score</td>
<td>54 19 &lt;0.001</td>
<td>63.5 +5.5 0.055</td>
<td>73 –10 0.07</td>
</tr>
</tbody>
</table>

Table 4. Impact of supervision on adherence to standard treatment guidelines: intervention group vs. control and vs. comparison groups – difference in median change in scores and P value from Mann–Whitney U-test

<table>
<thead>
<tr>
<th>Indicator condition</th>
<th>STG intervention compared to control (stock management intervention)</th>
<th>STG intervention compared to comparison (no intervention)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difference (%) p value</td>
<td>Difference (%) p value</td>
</tr>
<tr>
<td>Diarrhoea without blood</td>
<td>+31 0.017</td>
<td>+47 &lt;0.001</td>
</tr>
<tr>
<td>Acute respiratory infection</td>
<td>+7 0.030</td>
<td>+17 0.001</td>
</tr>
<tr>
<td>Urethral discharge</td>
<td>–1 0.0</td>
<td>+32.5 0.042</td>
</tr>
<tr>
<td>Genital ulcer disease</td>
<td>–3.5 0.9</td>
<td>+15.5 0.2</td>
</tr>
<tr>
<td>Overall score</td>
<td>+13.5 0.96</td>
<td>+29 0.34</td>
</tr>
</tbody>
</table>
requires mathematical ability (calculators are not universally
difficult to teach. For health workers to make the calculation
fundamental to the stock management system, but it is very
was 36.2%. The calculation of minimum stock levels is
very low – in the stock management intervention group it
was 12.1% and in the control group 8.1%. The score for calculation of minimum stocks in all groups is
significant changes in this indicator did not occur (Ministry of

The study utilized existing pharmacy staff based in the dis-
tricts, and two supervisory visits took place over a period of
6 months, as advocated by the national supervisory pro-
grame. In other words, the study reproduced as closely as
possible the conditions in a district in Zimbabwe, except
that the final evaluation took place after a further 6
months without further visits. The supervisors' understand-
ing of the stock management and rational drug use indi-
cators allowed them to focus their supervisory visit on the
areas of real deficiency in either stock management or
adherence to STG. Focusing the supervision allowed super-
visors to use their training in communication skills to
improve the knowledge and performance of primary level
workers. We did not attempt to assess the cost of the
supervision in relation to the benefits in this study, and we
recommend that a cost-benefit element be included in
future studies of this type.

There are a number of important limitations to the study. Pharmacy staff performed the baseline study, supervision and
final assessment, although different individuals were involved
at each step. They were not blinded and hence knew which
group they were assessing. (However, operationally there
were benefits in using the supervisors to make the assess-
ments as it helped to develop their skills in assessing the
impact of their work.) The single, pre/post design was rather
artificial, but was chosen to simplify the methods and mini-
imize costs. The long-term sustainability of supervision was
not assessed beyond 6–8 months.

In addition, the effect of extraneous factors could not be
taken into account. The stock management system was orig-
inally implemented with the primary aim of improving drug
availability, but drug availability is strongly influenced by the
supply performance of the central procurement office, which
is the only supplier of drugs to the primary health care level.
The possibility of private sector procurement did not exist.
Overall drug availability from the central procurement office
remained almost constant during the intervention1 and sig-
nificant changes in this indicator did not occur (Ministry of

The score for calculation of minimum stocks in all groups is
very low – in the stock management intervention group it
was 36.2%. The calculation of minimum stock levels is
fundamental to the stock management system, but it is very
difficult to teach. For health workers to make the calculation
requires mathematical ability (calculators are not universally
available in health facilities) as well as the motivation
through understanding how the calculation will be used. This
is particularly a problem because the entire ordering system
is based on this calculation.

Our study has found that even when supervision is focused on
another area of work, it may have a positive effect on overall
performance of the health worker. Some indicators showed
impressive improvements of 16–30% following supervision.
The overall stock management score showed moderate
improvement after the intervention of only 7%. However, in
the comparison group there was an overall deterioration of
9.5%.

The pre–post effect of supervision on adherence to STG was
found to be significant for all indicators, with an overall
improvement of 22%. When compared with the control
group, the improvement was significant only for diarrhoea
and ARI. Improved adherence to STG for genital ulcer
disease was seen in all three groups. This may have been
achieved by other activities undertaken nationwide by the
World Bank supported STI project and related to the new
ZEDAP STD-modules.

The greatest improvement in use of the STG occurred in the
case of non-bloody diarrhoea. Surveys conducted by ZEDAP
in 1993 and 1995 showed that although extensive training on
the appropriate management of cases of non-bloody diarr-
hoea has been provided (both through the development and
training of ZEDAP modules and from the Maternal and
Child Health department), the adherence to STG had not
improved substantially on a national level. Chronic repeated
episodes of diarrhoea place pressure on the prescriber to pre-
scribe a 'strong medicine', in the form of an antibiotic. The
results of this study show that drug management supervisors
can convince prescribers to reduce the use of antibiotics and
promote the use of oral rehydration therapy (ORT).

The substantial improvement noticed in adherence to STG
suggests that changes in clinical practice can occur as a result
of supervision. This is consistent with similar findings from
Uganda and Indonesia (Quick et al. 1991; Kafuko et al. 1994;
Santoso et al. 1996). Communication skills and focused mes-
sages on common conditions could be incorporated into the
basic pharmacy technician training programme.

In the past, pharmacy technicians have not been expected to
provide clinical supervision, as their basic training does not
provide them with the requisite skills. However, in this study
pharmacy technicians were provided the key information
needed to convince prescribers to change their prescribing
practices. This is similar to the way that drug representatives
in the pharmaceutical industry are trained to provide key
messages to change prescribing behaviour. Knowing the key
messages, acquiring in-depth knowledge on a few diseases
and treatment regimens, and fine-tuning communication
skills places the pharmacy technicians in a confident position
to impart knowledge and promote a change in prescribing
behaviour.
Supervision and drug management

Conclusions
Regular supervision (as few as two visits in 6 months) has a positive impact on the performance of primary care staff that is detectable 6 months later. However, training of supervisors must be focused on areas where improvements are needed.

Pharmacy technicians with limited clinical knowledge can be trained to influence prescribers to positively change prescribing practices and to improve stock-keeping practices. Techniques similar to those used to train commercial drug representatives can be utilized to train the non-prescribing supervisors who may lack formal clinical training. In this study, training was provided at a post-basic level.

Evaluating the effect of supervision on primary health care facility staff is possible through the use of outcome indicators such as stock management or drug prescribing measures. Investing in regular supervision is likely to prove more effective in terms of improving performance in both stock management and rational drug use by primary level health workers than the past practices of large group workshops or the provision of printed educational or reference materials. While these activities may be necessary at the beginning of a programme, regular on-going supervision would appear to be necessary for the sustainability of desired outcomes.

Endnotes
1 Overall drug availability was 75% in both the 1995 and 1996 ZEDAP surveys.

References


Acknowledgements
We are greatly indebted to the supervisors and trainers who made this study possible. Our special thanks go to Mr Wonder Goredema, Ms Charon Lessing, Mr Sidney K Mondoma, Mr Raphael K Githu and Mr Anthony Nleya. Furthermore, we would like to thank the Ministry of Health and Child Welfare, The Government Medical Stores and the Provincial and District health managers for their assistance and support to the establishment of drug management supervisors’ training and this study. Finally we would like to thank the World Health Organization Drug Action Programme, the International Network for Rational Drug Use and DANIDA for technical and financial support to the study.

Biographies
Birua Trap, MSc (Pharm), BSc (Economics), has worked with essential drugs programmes in several African and Asian countries as an employee of WHO and DANIDA. Her areas of interest include various aspects of pharmaceutical programme planning, management and implementation. She has been involved in the development of programme indicators, management information systems, rational drug use and human resource development, hereunder setting up systems for establishing drug management supervisors.

She is currently a PhD student in the Department of Social Pharmacy, Royal Danish School of Pharmacy, Copenhagen.
Charles Todd, MBChir, MRCP, is a family practitioner and until recently Senior Lecturer in the University of Zimbabwe Medical School. He has worked as a District Medical Officer in Zimbabwe and consulted for WHO and UNICEF throughout Southern Africa. He has worked extensively on the Zimbabwe Essential Drugs' List and is Deputy Chairman of the Zimbabwe National Drugs' and Therapeutics Policy Advisory Committee. His current post is Regional Health Adviser to the European Commission, based in Harare.

Heather Moore is a New Zealand pharmacist with an interest in developing monitoring and evaluation tools and training methods for drug management. She was formerly a consultant to the Zimbabwe Essential Drugs' Programme, and is currently working under the Pacific Technical Assistance Facility as a trainer for the Pharmacy Services Division, Ministry of Health, Solomon Islands.

Richard Laing, MBChB, MSc, MD, teaches international public health at Boston University School of Public Health. He has a long-standing interest in improving drug use in developing countries based on his prior experience in the Zimbabwe Essential Drugs' Programme (ZEDAP) and as past coordinator for the International Network for the Rational Use of Drugs (INRUD).

Correspondence: Dr Charles H Todd, University of Zimbabwe Medical School, PO Box A178, Avondale, Harare, Zimbabwe. Email: ctodd@heathnet.zw