The development of a transdisciplinary approach to promote the rational use of drugs: The Indonesian experience

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The inappropriate use of medicines is a common problem in developing countries. The idea of a multi-country effort to address the issue was initially discussed in Germany in July 1989 at a meeting of clinical pharmacologists from Asian and African countries and representatives of Management Sciences for Health (MSH), a US-based non-profit health consulting company, the Drug Policy Group of Harvard Medical School, and the Department of International Health Care Research of Karolinska Institute, Sweden. The International Network for Rational Use of Drugs (INRUD) was established later in the same year with the goal of promoting the rational use of pharmaceuticals (Ross-Degnan et al. 1992). Strategies formulated to achieve this goal are: (1) adopting an interdisciplinary focus, linking clinical and social sciences; (2) engaging in activities originating from country-based core groups of individuals from ministries of health, universities, non-governmental organizations and private sector institutions who are committed to sharing relevant experiences and technical cooperation; (3) emphasizing the importance of understanding behavioural aspects of drug utilization and prescribing; (4) promoting the development of well designed research studies leading to reproducible interventions to improve drug use; and (5) developing useful tools for research, including standard methodologies, simplified sampling and data collection strategies, and user accessible computer software (INRUD News 1991a). At present, six African countries (Ghana, Nigeria, Sudan, Tanzania, Uganda and Zimbabwe) and five Asian countries (Bangladesh, Indonesia, Nepal, Philippines and Thailand) are member countries of the network, which holds global and regional meetings.

The rational use of drugs was defined in 1985 by WHO experts as those instances when: patients receive medicine according to their clinical needs, in doses that meet their own individual requirements, for an adequate
period of time, and at the lowest cost to them and the community’ (WHO 1987 in Santoso 1995a). Irrational prescribing occurs, as Santoso (1995a) notes, when no drug therapy is indicated or ‘with [drugs of] unproven efficacy or uncertain safety status; with wrong dosages, administration and duration; and the failure to prescribe a well-known safe, effective and more affordable drug’. Irrational prescribing as indicated by Santoso (1995a) is common in Indonesia. According to a study done by the Ministry of Health of the Republic of Indonesia (1988), in collaboration with MSH and Yayasan Indonesia Sejahtera, various forms of inappropriate use of drugs were observed, including polypharmacy and over-use of antibiotics and injections (primarily antibiotics injected without proper diagnosis). It was found that over 60 per cent of patients received at least one injection, and that the use of injections did not vary with diagnosis.

Indonesia core group members of INRUD include medical doctors, pharmacists and myself, a clinical psychologist. Since 1990, we have collaborated on two major research projects to improve the appropriate use of drugs in public health facilities. One study involved a controlled trial of small group face-to-face educational interventions versus formal seminars in improving the rational use of drugs in acute diarrhoea (Santoso et al. 1996). The second was a controlled trial using a behavioural intervention, specifically Interactional Group Discussion (IGD), to reduce the use of injections in public health facilities (Prawitasari Hadiyono et al. 1996).

A third activity undertaken by INRUD core group members was to assist the District Health Administration to operationalize drug use indicators in its health delivery system (Bimo et al. 1994). The activities took place in Gunungkidul District, about 45 kilometres from Yogyakarta, where polypharmacy as well as the over-use of injections and antibiotics were common problems (Bimo et al. 1994). These activities began in June 1993 and continued until August 1995.

As a clinical psychologist, I saw joining INRUD as an opportunity to employ behavioural assessment and intervention methods to promote the rational use of drugs, especially to enhance the understanding of prescribing and drug use behaviour. One of the greatest challenges was learning how to collaborate successfully with health scientists, especially medical doctors, as equal partners. Psychologists working in medical schools are involved in a broad range of clinical, teaching and research activities, often under the leadership of their medical colleagues. As a member of the Faculty of Psychology, Gadjah Mada University (GMU), I enjoy greater autonomy and have more bargaining power in deciding the nature of my collaborative research activities than my social science colleagues, who are Medical School faculty members. To collaborate on an equal footing demands self-confidence, secure knowledge and a willingness to learn and
communicate across discipline boundaries on the part of all team members. This collaboration leads to a multidisciplinary approach in the beginning, an interdisciplinary approach in the process and, ideally, a transdisciplinary approach in the long run, as suggested by Rosenfield (1992) and Albrecht et al. (1998).

**Building Collaboration: Towards a Transdisciplinary Approach**

Different disciplines may use the same term in different contexts or with a different intended meaning. For example, health scientists often include, as qualitative methods, any methods designed to measure non-tangible physical matters. Behavioural measurement, although it uses scoring systems and numerical values, is considered by health scientists to be a qualitative rather than quantitative method. For behavioural and social scientists, qualitative methods are techniques of investigation that produce textual rather than numerical data. Attitudes, beliefs and behaviours that are scored in terms of strength or intensity by questionnaires or observation forms, while seen as quantitative methods by behavioural scientists, are nevertheless still referred to as qualitative methods by health scientists. This difference in point of view needs to be clarified early in the collaboration or significant misunderstanding can result.

Another issue that arises early in the collaboration is negotiation of ground rules. An important ground rule is sharing a commitment to the objective of each activity. If there are conflicting interests, the collaboration will be jeopardized and basic trust among the group members will be destroyed, ending the collaboration before it begins. Respect and fairness are the guiding principles behind another ground rule. Responsibility must be shared from the outset and be based on the expertise of each team member. Health scientists may not know initially what to expect from social scientists in terms of their potential contribution to the project, viewing their participation as 'token' – required by the funding terms of some international agencies' research programmes. This devaluation of the social scientists' contribution can lead to confusion and frustration for the social scientists about their role as team members. Open communication among the team members must be established in the beginning to identify the rights and responsibilities of each member. Open and shared management of the budget is highly advisable.

Willingness to learn and to communicate across disciplinary boundaries is also crucial to successful collaboration. To learn means to open one's mind to new and seemingly strange ideas. Remaining grounded within one's own discipline, however, is important. The collaboration, it is to be hoped, will change the attitude of team members towards their colleagues'
endeavours. Health scientists with a critical view of non-medical perspectives on the problem may acquire a more open attitude. The psychologist or the social scientist may become more concrete in the way she or he presents ideas, rather than use technical jargon or abstract terms. If team members are willing to learn from one another, communication flows and a 'common language' emerges. This view accords with the findings of a study by Jetten et al. (1996) in which they demonstrate the importance of in-group norms and the power of the group to define the self and guide behaviour. The collaboration begins in earnest once the team members can understand each other's language and establish basic trust. Understanding each other's messages, openness to others' ideas, supporting each other's work, and, at times, supporting one another in personal matters are norms that ensure the group's productivity. Likewise, Suryawati (1997) notes that an equal commitment, an equal openness and a willingness to respect other opinions are needed in order for the transdisciplinary research team to be successful. She adds, however, that the contribution of each team member does not have to be equal, but will depend upon project needs that have been agreed from the start. One member does not have to feel discouraged when her or his contribution to the project is less central.

The process of building a solid collaboration takes time. Before joining the INRUD country core group, I was invited by the health scientist team leader to present a paper on the psychological aspects of obesity at a seminar. The intent of the invitation, although I did not know it at the time, was to assess whether I would be a compatible team member. A collaboration is analogous to a marriage. Although the practice might sound strange to non-Indonesians, Javanese tradition allows the prospective bridegroom in a pre-arranged marriage and his family to observe the bride at a gathering arranged by other family members in order to decide whether she would make a suitable wife and daughter-in-law. A few months after the seminar I was invited to join INRUD. Like a ‘Javanese bride’, I accepted, naively perhaps, knowing little about the health scientists who had asked me to join their team, nor exactly what I was expected to contribute. My judgement was that joining INRUD was a challenging opportunity to expand the application of psychological assessment and intervention to the field of drug use. Joining this group would also provide an opportunity to collaborate internationally. These two considerations formed the basis of my commitment to join the group. One lesson learned from this experience is that prospective social scientist 'brides' need to consider whether they will be ensured an opportunity to enrich their own professional growth before they decide to engage in a 'marriage' with the health scientists. Like marriage partners, members of a collaborative research team have to be compatible with one another.
During the inauguration of INRUD in 1990 in Yogyakarta, I suggested involving patients to promote the rational use of drugs and using small group discussions as both an assessment and intervention tool. Focus Group Discussions (FGDs) could be used to assess prescribers’ and consumers’ beliefs and practices regarding drug use in the community. A second series of FGDs, later renamed Interactional Group Discussions (IGDs), would function as an intervention by bringing together patients and prescribers to discuss findings from the prior FGDs. By participating in the same group discussion, prescribers and patients could learn from sharing points of view. The facilitators, who would be clinicians and behavioural scientists, could educate members of the group in the appropriate use of medicine. This idea met with resistance from the clinicians, to whom it represented a different way of approaching the problem. The source of clinicians’ resistance derived mostly from the fact that patients were considered ignorant about appropriate drug use. It was also considered unethical as well as impractical to bring together patients and prescribers in the same group, since prescribers have a higher status in the community than do patients. Clinicians were afraid that the patients would be intimidated by the differential power relationship and not say anything. I acknowledged their objections but worked hard to convince them of the merits of the idea. By the same token, this kind of collaboration, in which social scientists participate not only in delineating the problem but also in developing solutions, was new to me – as it may be to other social scientists working within a multidisciplinary framework. Many social scientists view their role as detached observers and critics of health practices without offering solutions. As a clinical psychologist, I was attracted by the action-oriented approach of INRUD and the opportunity it afforded for integrating social science perspectives into finding solutions to health problems rather than criticizing the limitations of the biomedical model.

The first collaborative project undertaken was an evaluation of the effectiveness of two different educational intervention methods – namely, the large group seminar and small group face-to-face discussion in the treatment of acute diarrhoea in children (Santoso et al. 1996). The proposal was developed before I joined the team. Thus it had been decided by the team leader that my initial task would be to write the FGD guides and lead the collection and analysis of qualitative data on beliefs and perceptions related to the treatment of acute diarrhoea in children. Although all team members were present during the data collection, my psychology colleagues and I took responsibility for conducting 18 FGDs with mothers, paramedics and medical doctors in six health districts. Data from the FGDs were used to develop intervention materials. This differentiation of tasks and separation of responsibility at the start of the project betrayed a
multidisciplinary team approach in which each team member worked consecutively or concurrently from a specific disciplinary perspective to address a common problem (Rosenfield 1992).

In designing and implementing the intervention, the research team addressed the problem from an interdisciplinary framework. The intervention strategies employed large group seminars conducted in a lecture format and face-to-face discussions. The initial intervention strategy, a single face-to-face intervention, was modified to accommodate my suggestion that small group discussions would be more efficient because they would allow the team to cover each health centre in a single visit. Together, the team planned how two supervisors from two district health offices would carry out the small group discussions. The team then trained the two supervisors, who became the group facilitators and assessed and revised the training format. It was at this point that the team began to function in a transdisciplinary manner. Team members moved from working jointly but from a disciplinary-specific basis to working jointly using a shared conceptual framework that drew together disciplinary-specific theories, concepts and approaches to address the problem (Rosenfield 1992: 1351). This movement accords with what Albrecht et al. (1998: 60) describe in the second approach to developing a transdisciplinary research team: 'Disciplinary boundaries are blurred as researchers work cooperatively to bring together into some unified framework the diverse elements of a total explanation, including the objective and subjective, the reductionistic and holistic and so on ... Under a shared conceptual framework, discipline boundaries disappear altogether or are “transcended” and a new or “transdisciplinary” way of explaining a problem is created.'

A Transdisciplinary Approach to Changing Prescriber Behaviour

The second project undertaken by the group was conducted entirely within a transdisciplinary framework (Prawitasari Hadiyono et al. 1996). The team expanded to include two new physician team members – one from the university and the other the medical officer (MO) in the District Health Office (DHO). The idea I presented during the inauguration of INRUD in 1990 was formally followed up in 1992 in this study aimed at reducing the over-use of injections in public health facilities. Although most health research projects are led by a health scientist, I became the principal investigator and received the full support of the health scientists on the team as well as health scientists in the District Health Administration (DHA) office. The project was first offered to a district health office in Central Java, where the injection rate with no specific diagnosis was high. (The delivery of the injection itself was seen by both patients
and providers – who are mostly paramedics – as a cure for the patients' complaints. Patients were injected with vitamins.) When it failed to generate enthusiasm from the MO there, the study was offered to Gunungkidul District, where the injection rate was also high. The team worked in a highly interactive way, sharing the tasks of writing the proposal, developing the intervention procedure, collecting and analysing the data and writing the manuscript for publication. During the writing period, the INRUD support groups in Boston, Geneva and Newcastle actively reviewed and provided valuable input on the manuscript.

Santoso (1995b) observes that, 'overuse of injections often stems from misconceptions of their value and efficacy by both the prescriber and the patient'. To pilot-test their effectiveness in modifying patient and prescriber behaviour with respect to injection drug use, IGDs were conducted with prescribers from Yogyakarta and volunteer patients. IGD participants were medical doctors, paramedics and patients, who were mostly mothers. Their composition, in which membership is heterogeneous, differentiates them from FGDS, in which membership is homogenous. The objective of FGDS is obtaining information, whereas that of IGDs is imparting information. Two trial IGDs were conducted at the Faculty of Psychology, GMU. The first IGD trial experienced some difficulties. The facilitators were perceived as attacking the personal practice of participants with respect to injection use. The prescribers, in particular, became defensive. Ideally the discussion has to be pleasant so that no one in the group loses face. The IGD was, however, informative for the patients who gained knowledge of the circumstances in which injections are necessary, such as emergency care or the treatment of major infection. The first trial provided an opportunity for the team to work together in revising the discussion procedure. The strategy was changed in the second IGD trial to diffuse the defensiveness of the medical doctors and encourage them to participate in teaching the paramedics and patients about the proper use of injections.

In the main study, IGDs proved effective in reducing the use of injections. The hypothesized mechanism of behaviour change involved reality testing assumptions about patient beliefs, imparting scientific information about efficacy of injections, and establishing peer norms around correct injection use behaviour (Prawitasari Hadiyono et al. 1996). Six prescribers and six patients (mostly mothers and a small number of fathers) participated in each IGD. Prescribers were physician managers of health centres, paramedics and other medical doctors. A psychologist and a clinician/pharmacologist facilitated the discussions that took place in a restaurant in Wonasari, Gunungkidul (see Prawitasari Hadiyono et al. 1996 for details). Findings from previous unpublished FGD research identified gaps between prescribers' and consumers' perceptions regarding the use of injections in
health centres. Prescribers claimed that it was patients who asked for injections. In contrast, patients said that it was the prescribers who recommended giving injections. To test the reality of the situation, at the beginning of the discussion the facilitators asked how many of the patients either preferred receiving injections or requested them. This information then became the focus of discussion. Group members were also guided to discuss the proper use of injections and the possible risks of misuse. At the end of the IGDs prescribers agreed to reduce the misuse of injections and patients agreed to inform their family and neighbours about their experience in the group and not to ask for injections unnecessarily. This agreement supported the development of peer norms about correct use of injections.

To assess the effectiveness of IGDs, prescribing surveys were conducted in 24 health centres in the study area three months before and three months after the IGDs. These health centres were randomly assigned to intervention and control groups. Prescribers from twelve health centres participated in IGDs and those from the other twelve health centres served as control groups. Twelve prescribers in each health centre recruited twelve patients. The patients were exchanged between IGD groups so that the prescribers would not be in the same group as their patients. The prescribing survey was done retrospectively at the end of the observation period by using health centre records. Each prescribing survey, at minimum, consisted of the last 100 cases of the month from each health centre.

Figure 4.1 shows a significant decrease in the use of injections in the intervention groups compared with the control groups. Following the IGDs, there was a rapid and stable reduction in the use of injections from

![Figure 4.1 Use of injection before and after IGDs](image-url)
the pre-intervention rate of 69.5 per cent to an average of 42.3 per cent during the post-intervention period in the intervention groups. Injection use also declined from 75.6 per cent at baseline to 67.1 per cent at follow-up in the control groups, but the reduction was statistically greater in the intervention groups (Prawitasari Hadiyono et al. 1996). These data were presented to all health centre staff during the feedback seminar in April 1993 in the Gunungkidul District Health Office.

The collaboration with the MO of the Gunungkidul District Health Office continued into a third project to address locally the global INRUD priority concerns of polypharmacy and the over-use of antibiotics and injections. Two members of the INRUD country core group joined the project team. Both are medical doctors. One works with a non-governmental institution and the other at the Department of Health.

Two goals were jointly addressed: the development of self-monitoring procedures for rational drug use (Bimo et al. 1994) and testing the applied field methods manual developed by INRUD social scientists for use in drug utilization studies (Arhinfuf et al. n.d.). In mid-1993, the INRUD team trained the Gunungkidul district health administrators (DHAs) in developing their own instruments to self-monitor drug prescribing. The training included an initial workshop in the DHA office to orient staff to the urgency of the problem and to quantitative drug use indicators (WHO/DAP 1993) as well as selected applied field methods, such as focus group discussions, in-depth interviews, structured observation and questionnaires. The workshop participants also agreed to conduct a prescribing survey to assess drug use in the health centres. Data were obtained on the use of antibiotics, injections and polypharmacy and the underlying factors identified through applied field methods.

A core DHA team comprised of DHA personnel and a medical doctor from a health centre and another from the district hospital was divided into two groups. One group was trained in developing quantitative drug use indicators (WHO/DAP 1993), while the other was trained in developing instruments based on applied field methods. The core group then trained appointed prescribers at each health centre to use the instruments.

The resulting self-monitoring procedures included: (1) a monthly random survey of 30 cases at each health centre and 30 cases at each of the sub-health centres to measure the use of antibiotics, injections and polypharmacy; (2) monthly observation of clinical encounters between paramedics and patients by the health centre manager; (3) monthly interviews with paramedics and patients done by the health centre’s own team; (4) monthly discussion with all health centre staff about appropriate solutions to the problems found; and (5) monthly meetings of health centre managers at the DHA to discuss the centres’ self-monitoring results.
In August 1993, four health centres were selected in which the instruments were piloted. Managers of those four health centres and appointed paramedics in each of the facilities were trained to administer the procedures by the district core team. Prawitasari Hadiyono and Suryawati’s (1994) follow-up study indicated that within three months of adopting the procedures, there was a significant improvement in drug prescribing as reflected in the reduction of polypharmacy (3.5±0.2 to 2.9±0.1; p<.05), antimicrobial use (45.8 %±9.2 to 28.4 %±2.3; p<.05), and injection (35.8 %±20.9 to 17.4 %±9.7; p<.05). These encouraging results led the DHA to implement the self-monitoring procedures in all 29 health centres in the district, as reported by Sunarton and Darminto (Santoso 1995c).

Interviews with the district medical health officer, district core team members, managers and prescribers involved in the pilot study revealed that, overall, they were pleased with the procedures. They reported that the procedures helped them substantially in managing the use of drugs in their facilities. Questionnaires used to obtain underlying information regarding the use of antibiotics, injections and polypharmacy, however, were found to be less useful than in-depth interviews in terms of the richness of the information they yielded. Additionally, it was found that monthly discussions at the DHA created peer pressure to conform to the targets set by the health centres themselves. Reports must be made prior to this DHA monthly meeting. To avoid embarrassment during the meeting, each health centre strove to meet its monthly targets in compliance with the monitoring procedures, as reported by Sunarton and Darminto (Santoso 1995c, 1995d).

The self-monitoring procedures were subsequently adopted by the Department of Health of the Republic of Indonesia in developing management guidelines for rational medication use in health (Tjondrowardojo et al. 1996). Discussion, interview and observation methods were included in the monitoring procedures, along with drug use indicators. Clearly, the third project was successful in developing procedures for improving prescribing in the national health delivery system.

In 1994, INRUD core group members began a fourth study in collaboration with Dennis Ross-Degnan, one of the support group members from Harvard University, to examine drug utilization rates in health centres following the initial intervention in 1992 and the implementation of the self-monitoring procedures in 1993 and 1994. Results of a time series analysis indicated that the use of injections in general, with no specific type of treatment, was substantially reduced from 72 per cent to 16 per cent in health centres that were involved with the IGD, and from 68 per cent to 21 per cent in the health centres initially acting as control groups. There was less of a reduction in the use of antibiotics, but the trend was one of
Asia and the Pacific

FIGURE 4.2 Time series data on injection use, Gunungkidul District, 1995

decreasing usage. Number of drugs prescribed tended to decrease as well. The time series analysis shows that behavioural interventions (IGD and self-monitoring) have had a substantial impact in improving appropriate prescribing in health centres in Gunungkidul DHA, especially with respect to the use of injections. It is concluded that behavioural interventions combined with managerial interventions are effective in reducing the over-use of injections and improving overall prescribing. Figure 4.2 shows the time series analysis with respect to injection use following behavioural and managerial interventions.

It indicates a decrease in injectable drug use both in the IGDs as well as control groups after the IGD feedback seminar in April 1993. Although both experimental and control groups tended to reduce the use of injections to a minimal level, the experimental groups did so more than the control groups. From this it can be concluded that the dissemination seminar also had a significant effect on injection prescribing in all health centres. While it is not possible to separate the impact of the IGDs from that of the subsequent implementation of the self-monitoring procedures, the existing literature in behavioural sciences offers clues about how each of the strategies might have induced changes in prescribing behaviour.

Influencing Changes in Prescribing Practices

Studies in social psychology indicate that group membership can result in behaviour change by individuals who tend to comply with group norms
and peer pressure (Mackie et al. 1990). In addition, cooperation, consensus and conformity are promoted (Orbell et al. 1988; Wright et al. 1990; Jetten et al. 1996). Group membership has important meaning for Indonesians. As a broad cultural generalization, Indonesians believe in harmony. They are described as having a relatively passive attitude towards life, emphasizing quiet security, self-control, conformity and group-oriented behaviour (Hadiyono and Kahn 1985). Joining the IGDs sets up norms to be agreed upon and followed. At the end of each IGD, participants together usually proclaimed their commitment to reducing injection use in their facilities. Patients also committed to share their experience in the group and teach their neighbours about the unnecessary use of injections. This might be why members of health centres involved in the IGDs reduced their use of injections more than did the control groups.

Group norms and peer pressure were likely to have also contributed to the success of the IGD feedback seminar in bringing about change in prescribing behaviour. This seminar was conducted in a semi-formal way at the DHA office. In the first half, data on injection drug use in individual health centres were presented, while the second half was used for open discussion. Suryawati began her presentation by covering the names of the health centres with the highest rates of injection. The audience asked her to remove the cover, which she did with the permission of those assembled. Everyone was able to see which health centres had the highest rate of injection drug use. Audience members started to mock one another. Javanese culture permits the use of humour as a means of modifying behaviour. The rule is that each party accepts the mocking as humour; offence should not be given or taken. Control group members jokingly complained about the fact that they were not invited to the restaurant where the IGDs were held. Food and togetherness for Javanese are very important. Such a group atmosphere is a vehicle for persuading people to follow certain norms.

The impact of self-monitoring on prescribing behaviour may lie in its strength as a technique for modifying self-control. Behaviour modification theory operationalizes behavioural problems as behavioural deficits (the low occurrence of an appropriate behaviour) and/or behavioural excesses (the occurrence of behaviour is too high) (Martin and Pear 1992). Polypharmacy and the over-use of antibiotics and injections can be viewed as behavioural excesses that can be modified by systematically observing one's own behaviour (Kazdin 1994).

Systematic self-observation was employed in the Gunungkidul self-monitoring procedures. First, each month health centres completed observation forms that allowed staff to compare drug use from month to month. The form was also sent to the DHA for review. To ensure that the procedure is carried out, there is a weekly staff meeting of the district core.
team, to discuss the results of each health centre’s monitoring. Second, a monthly DHA level meeting for health centre managers is held to report on and discuss monitoring results. Third, random feedback and supervisory visits are made to health centres by the district core team, as reported by Sunartono and Darminto (Santoso 1995e).

From a transdisciplinary perspective, the success of the interventions in addressing rational drug use in health centres may be largely due to the active participation and broad collaboration of the team members. The academicians provide technical assistance in developing the feedback system and supporting follow-up by sending visitors to observe the health delivery system in Gunungkidul district. The district managers have integrated research methods into their managerial feedback procedures. Managers in health centres facilitate discussions in their own facilities regarding problems arising each month. These monthly discussions allow problems to be addressed as soon as they arise. Sunartono et al. (1997) advise that feedback from the DHA is to be continuously conducted each month to preserve the changes in drug use in the health centres. The resulting transdisciplinary approach parallels the approach described by Albrecht et al. (1998), where all members of the team were actively involved in developing community-based heart disease prevention initiatives.

**Impacts of the IGD, Feedback Seminar and Self-monitoring**

Interventions may produce intended as well as unintended impacts and cause harm in addition to benefits. Positive impacts of the interventions in Gunungkidul include several changes in health centre clinical practice. The prescribers began to use treatment guidelines more frequently in caring for the patients. Making simplified guidelines available in each of the health centres may support more accurate diagnosis and lead to appropriate drug prescribing. Greater rationality in the use and supply of drugs in each health facility can lead to cost savings.

Prescribers indicated during the IGDs that they feared losing patients if they did not meet patient demands for injection. Their fears proved to be unfounded. Patient attendance at health centres did not decline. In fact, it remained the same in all health centres. In a FGD follow-up study with prescribers in April 1995, some sub-health centres reported that they lost patients after reducing their use of injections. However, they could not provide exact numbers of patients to support their claim.

Another unanticipated, yet positive, impact was an apparent increase in community health education. Consultation time increased from two minutes to five minutes. Providers began to explain how to use the drugs given, the side-effects, and also the nutritional factors that should be considered by
the patient. Suryawati and I observed this during follow-up observations and interviews in April and May of 1994 with providers in four health centres involved in the IGD as well as the self-monitoring procedures. We learned in an interview with the medical officer of the district health office that he intended to implement the self-monitoring procedures in all health centres in Gunungkidul district so that his successors might follow it. Although he moved to another district 1995, the system is still in place.

The continued use of the system is also supported by the fact that GMU Centre for Clinical Pharmacology and Drug Policy Studies has served as a WHO collaborating centre since 1995. Guests from India, Myanmar, Nepal, Vietnam and elsewhere have visited the district to learn how the system operates. These visits helped to reinforce the system’s merits among district health personnel.

The medical doctors who participated in the follow-up FGDs in April 1995 stated that they had never heard of IGD. When asked about prescribing injections, they said that patients did not ask for specific treatment or injections. We can hypothesize that after the IGDs, patients’ awareness improved regarding injection use. The mothers, many of whom were community health cadres, may also have educated community members regarding the unnecessary use of injections. This hypothesis, however, needs to be proved in a further study.

Despite the positive impacts, several unanticipated negative impacts were noted. During the follow-up FGDs in April 1995, paramedics involved in the self-monitoring procedures complained that they had to travel to collect data and take lengthy notes in each health centre. They felt that the process was time-consuming and burdensome with no adequate incentive. The paramedics also commented that more patients now go to other health centres and private practices to obtain injections. Some revealed that paramedics have begun buying their own syringes in order to satisfy patients demanding injections through their private practice. These reports demonstrate an alarming incongruency in the paramedics’ health centre and private practice behaviour. The extent to which this practice occurs needs further investigation.

As Figure 4.3 demonstrates, each of the studies to date has led to a follow-up investigation, providing new leverage for subsequent work. Quantitative and qualitative research methods are used in fact-finding as well as impact assessment. Innovations in intervention strategies are tested in each study, providing another leverage point for developing a new procedure. All transdisciplinary team members are active in each study and work together to implement and support the findings in their own capacity.
GMU Rational Use of Drugs TD Team: clinical pharmacologists, behavioural scientists, district health managers, health centre managers, medical doctors, paramedics, patients

Problem 1
Irrational diarrhoea treatment

Qualitative/quantitative analysis: interview/FGD drug use indicators

Educational intervention: large seminar vs small group discussion

Qualitative/quantitative analysis: patient's and prescriber's points of view

Identify leverage point: knowledge gap patient/prescriber re: ORS

Problem 2
Overuse of injection in district

Impact assessment: interviews/FGD: managers/prescribers/patients drug use indicators

Specific Behavioural Intervention: IGD

Qualitative/quantitative interview managers drug use indicators re: injection

Identify leverage point: perception gap patient/prescriber in need for injections

Problem 3
Overuse of antibiotics and polypharmacy in district

Impact assessment: interviews/FGD: managers/prescribers/patients drug use indicators

Specific intervention: self-monitoring by health centres and district

Qualitative/quantitative analysis: managers/prescribers/patients drug use indicators

Identify leverage point: system feedback

FIGURE 4.3 Transdisciplinary action research cycles
Future Directions

Many tasks lie ahead for our transdisciplinary research team. One is to refine our intervention design and share it with other researchers. We have presented our studies at international conferences, and participants have asked for advice in replicating our study design. We have supported fully such requests by providing necessary assistance, including a request from a Vietnamese group who have replicated the self-monitoring procedures in their health system.

Currently, Suryawati, two other junior team members and myself are developing community education intervention materials to reduce injection use in primary health care facilities. These materials are designed to complement the health education conducted by the health centre staff themselves. In this study, funded by the Ministry of Health, one of the intervention methods pilot-tested is a behavioural strategy using surrogate patients to monitor the use of injections in health centres and present their findings, with the assistance of the manager, to prescribers. This method, called IGD Plus, however, proved too costly and was feared to influence the morbidity pattern if used widely. We decided instead to implement a combined method consisting of brief lecture, IGD and posters, and this was found to be as effective as IGD Plus (Suryawati 1998).

Indonesian early-career researchers in drug use studies have also emerged. They have developed intervention strategies to improve the quality of medications for children used both in hospitals and health centres. Two pre-proposals by senior students at GMU Medical School and a graduate student in the GMU Management and Drug Policy Studies graduate programme were among the best ten, and one was among the best 18 submitted. This competition was held during a joint workshop on drug use intervention proposal development hosted by INRUD Indonesia, the WHO Collaborating Centre for Research and Training on Rational Drug Use and Gadjah Mada University and sponsored by the Applied Research on Child Health (ARCH), the WHO Action Programme on Essential Drugs (WHO/DAP), the Rational Pharmaceutical Management (RPM) Project and INRUD (INRUD News 1998; Suryawati 1998). Unfortunately there was no young social scientist interested in submitting a pre-proposal.

In conclusion, the transdisciplinary research team will continue to develop new intervention strategies to improve the use of medicine in Indonesia. Leverage points for engendering change indicated in previous studies will be followed up in subsequent intervention research. Early-career researchers will join the team to sustain existing efforts in improving the use of medicines in the community.
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