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COST-EFFECTIVENESS ANALYSIS OF BEHAVIOUR CHANGE INTERVENTIONS: A PROPOSED NEW APPROACH AND AN APPLICATION TO EGYPT

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Summary. This paper presents a new approach to cost analysis of family planning programmes that focuses on behaviour change of programme clients as the final 'output' rather than units of contraceptive services delivered, as does the familiar couple-years-of-protection index. It is useful to know how much it costs to deliver a unit of contraceptive services, but it would also seem useful to know how much it costs to change a prospective client's behaviour. The proposed approach rests on the familiar 'steps to behaviour change' paradigm and: (1) develops a methodology for applying a client-behaviour-change-centred cost analysis to programme activities; (2) tests the methodology and concepts by applying them retrospectively to a case study of mass media interventions in Egypt; (3) derives cost per unit of behaviour changes for these Egyptian communications campaigns to demonstrate the workability of the approach. This framework offers a new approach to impact evaluation that would seem to be applicable to other components of family planning and reproductive health programmes.

Introduction

Cost-effectiveness analysis is a widely used procedure that generates estimates of the cost per unit of achieving programme outputs so as to obtain the maximum performance levels at the least cost per unit (Warner & Luce, 1982; Garber & Phelps, 1995; Simmons, 1987; Gold *et al.*, 1996).

A large number of studies have been undertaken of the cost of specific family planning projects, clinics and country programmes. Some studies have attempted a comparison of various approaches, method-mixes and organizational structures with respect to cost per unit (Robinson, 1979; McBride *et al.*, 1979; Huber & Harvey, 1989). Others have looked at the cost per acceptor of integrated health–family planning versus family planning alone approaches (Reinke, Blumenfeld and Gomez,

all cited in Sirageldin *et al.*, 1983); clinic- versus community-based delivery systems (Bordes *et al.*, cited in Sirageldin *et al.*, 1983); surgical versus other methods of contraception (Ojeda, Janowitz and Satia, all cited in Sirageldin *et al.*, 1983); mobile units versus fixed health posts (Coeytaux *et al.*, 1989); centralized versus de-centralized management systems (Vernon *et al.*, 1993); clinical versus non-clinical methods (Foreit *et al.*, 1993; Janowitz *et al.*, 1994); and different organizational structures (Schultz, 1992; Barkat & Howlander, 1996).

Most of these studies have used cost per couple-year-of-protection (CYP), the familiar measure of programme output that employs data on contraceptive supplies utilized (or distributed) and assigns each method a time-wise impact weight (one IUD equals 2·6 years of protection, and so on) so as to arrive at an estimate of total 'years of protection' generated. CYP requires only supply distribution data, which most programmes routinely track, and these provide a common denominator for adding up disparate methods into a single unit of output (Wishik & Chen, 1973). CYP is thus a measure of contraceptive commodities supplied, not actual use or final impact on client behaviour. In effect, the CYP approach takes demand for granted and then attempts to find the least cost per unit programmatic way of delivering commodities and services. Useful as such results are, it would also be useful to look at the cost per unit of affecting the demand for services; that is, the impact of those programmatic components that aim at affecting client attitudes, behaviour and practice. This is usually thought of as the 'communications' component of a programme.

Background

The role of communications in the adoption process

The underlying rationale of all 'Behaviour Change Communications' (BCC) interventions is that communication activities facilitate the diffusion of contraceptive knowledge and the ideational change needed to gain new adopters (Kincaid *et al.*, 1999). Clients cannot use a service if they are unaware of the existence of the services and will not adopt if they see no personal benefits. BCC activities thus aim to achieve these impacts upon clients, and there is a growing body of research supporting the belief that they do, in fact, have such an impact (Bertrand & Kincaid, 1996; Westoff & Rodriguez, 1993; Westoff & Bankole, 1997; Foreit *et al.*, 1989; Piotrow *et al.*, 1990).

The 'Steps to Behaviour Change' (SBC) paradigm was developed by the Johns Hopkins Center for Communications Programs to study this process and these impacts (Piotrow *et al.*, 1994). This paradigm explicitly assumes that family planning programme demand increases as BCC programme activity modifies the knowledge base, the attitudes, intentions and behaviour of the intended target population. Further, it postulates a series of steps by which this process works, a kind of continuum as a client is moved from unknowledgeable non-use to confirmed use and advocacy. (Similar approaches have been proposed for other health-related interventions: 'Applied Behaviour Change', for example, in the case of HIV–AIDS programmes; Ross, 1997; Drummond *et al.*, 1993.)

Determining optimal expenditures on BCC activities

If both the cost and client-impact of a given programmatic behaviour change communication intervention can be measured over a defined length of time, the cost per client-impact of the communication intervention can be calculated. If programme managers have the option of choosing among two or more BCC approaches (mass media versus fieldworker outreach, for example) to achieve the same outcome, then the least-cost per client behaviour change solution can be identified and chosen. In principle, such cost analysis could identify the least-cost combination of BCC inputs required to move a client across the entire transition from uninformed non-acceptor to satisfied user-advocate. This is an admittedly ideal solution, which may or may not be possible in practice, but the logic can still guide more modestly focused empirical studies.

The most important methodological and empirical issues that arise in applying such cost analysis to BCC activities are the definition of a unit of achievement (or impact), and the discrete measurement of communication intervention costs. A framework has been developed that deals with these problems and which yields costs per impact unit for communication inputs. This present paper tests this framework using retrospective data from Egypt in the period 1995–98. Egypt was chosen because: (1) of the availability of good cost and BCC impact data; (2) communication activities have played a widely recognized role in the success of the family planning programme; (3) modern electronic mass media (radio and TV) have been paramount in its reach and primacy as a source of information on family planning. This primacy of modern mass media leads also to the decision that the Egypt cost-effectiveness analysis of BCC would cover only mass media-based interventions and their impacts.

A brief sketch of family planning BCC activities in Egypt

Meaningful family planning programme activities in Egypt go back many decades and mass media activities date from 1978, with the creation of a family planning communication centre within the State Information Service (SIS) of the Government of Egypt. (There are two nationwide and several regional TV channels in Egypt, as well as several radio stations serving various market areas, but all are controlled by the SIS.) Initial radio and TV messages were broadly educational stressing the theme of excessive population growth as a national problem. The messages made little effort to relate this national problem to the day-to-day social and economic concerns of the listener–viewer (Parlato *et al.*, 1988; Hess, 1997). They also lacked any specificity concerning contraceptive methods, benefit of use, sources of supply or possible problems. In retrospect, this first phase (1978–1985) of family planning communication probably did lead to a greater awareness of family planning and helped create a latent demand for contraceptive services. However, a survey-based evaluation of the impact of the communication programme showed clearly that a more specific focus on methods and sources of supply was needed (Bogue, 1983; Parlato, 1988), but a contraceptive-focused mass media campaign was controversial and was opposed, even by people who were otherwise sympathetic to the goals of the programme, out of fear of a conservative religious backlash. Nevertheless, a new higher visibility campaign was launched in the late 1980s. It was a multimedia campaign in which posters,

leaflets and active outreach by fieldworkers was employed, but particular emphasis was placed on the use of the electronic mass media and specifically TV. Television ownership is widespread, with over 90% of urban and 70% of rural households owning a TV set in 1992. Television ownership is, in fact, higher than radio ownership nationwide and studies have shown that most women rely upon TV as their main source of new information (National Population Council, 1995).

The new TV campaign kicked off with a series of short dramatic presentations built around a family planning theme: *Danger* and *Ghalia's Way* in 1988; *The Long Race*, *Extremely Urgent* and *Personal Identity* in 1989; *The Loom* and *A Day in the Life of a Happy Family* in 1990; and *Why Does the Swallow Cry?* in 1993. Each was a self-contained unit running for 15–20 minutes on all major TV channels with repeats on regional channels. About ten shorter spot commercials were also produced and shown an average of 21 times a quarter on all major channels. Radio spots, dramas and message-inserts in other programmes were also employed extensively (Underwood *et al*., 1994; Hess, 1997).

The mass media campaign was well received by the public and aroused no serious opposition. It culminated in the very popular seventeen-part TV series *And the Nile Flows On*, which is still repeated from time to time. Also noteworthy were *The Doctor's Diary*, featuring a well-known actress in the role of Dr Zarina, who answered specific questions about the IUD and pills; and *Zemana*, a series of humorous spots featuring a meddlesome but well-informed mother-in-law who combats negative rumours about family planning. This high visibility mass media campaign marked a turning point in the history of the Egyptian family planning programme.

Impact of the overall BCC programme effort

Contraceptive prevalence rose from about 24% in 1980 to 38% in 1988 and 47% in 1992. (In 2000 it was nearly 60%; Ministry of Health and Population, 2000.) The present exercise is not arguing that increased contraceptive use is exclusively the result of BCC efforts since it is clear that were the services not available, any increase in contraceptive use would have been substantially smaller. Other positive improvements were occurring within the overall programme: introduction of new methods, improved quality of services, better training of staff and also more dynamic leadership, which effectively increased the volume and also quality of the supply of services available. On the other hand, there is evidence that a substantial increase in total demand for services also occurred. A recent effort at decomposition of the total increase in contraceptive prevalence in a large group of developing countries over the period of roughly 1980 to 2000 found that, for Egypt, some 80% of the increase in prevalence was due to a change in family-size preferences and only 20% to a more effective implementation of the original base-year preferences. From 1980 to 1995 the reported 'ideal family size' fell from 4·0 to 2·9, but availability of services evidently lagged slightly since 'unmet need' (the percentage of women who desired no more children or to delay the next birth but who were not currently contracepting) rose as BCC activities began having an impact, and then fell as services became increasingly available by the early 1990s (Feyisetan & Casterline, 2000). An independent impact of the BCC demand-creating activity is strongly suggested by this observed outcome.

The four concurrent mass media campaigns

Family planning BCC was well launched by the early 1990s. This analysis will deal with the four relatively sharply focused TV campaigns that made up the mass media BCC effort in the period 1995–1998. The total Egyptian family planning supply network comprises government facilities of several types: an NGO/PVO sector and private commercial outlets, most notably pharmacies and some provider-types, dominate in the supply of some methods. The data ignore the issue of which provider is involved since all users, whatever their supply source, are counted in the contraceptive prevalence surveys.

The private sector initiative 'Ask–Consult' campaign. 'Private Sector Initiative' (PSI) was a family planning media initiative undertaken by a local consulting group under contract with USAID and SIS. In the mid-1990s they designed TV spots focused on a new 'logo' and slogan ('Ask–Consult') aimed at encouraging greater interaction between prospective clients and service-providers, particularly the private sector pharmacists who are the leading source of supplies for pill users. The programmatic goal was an increased demand for 'quality services' on the part of clients, and an increased supply of quality services by providers. The follow-up impact survey conducted by a private media research group for the SIS contacted a nationally representative survey of some 1800 women who regularly watch TV to measure the reach and impact of the campaign. It was found that some 50% of the respondents could identify the 'Ask–Consult' logo (although nearly 90% reported remembering some family planning message on TV). Over 90% of those exposed to the advertisements liked them, and some 70% correctly understood the message. About 20% of exposed respondents reported discussing the advertisements with their spouse, relatives or friends, but 40% reported that exposure to TV spots – the PSI and others – had led to such discussions and 16% reported that these cumulative TV spots had led them to seek family planning services (Brancich *et al*., 2001; Hess, 1998b).

The 'Gold Star Clinic' campaign. In recent years there has been a major thrust for improving quality of services in the government health facilities under the Systems Development Project (SDP). Since the early 1990s, clinics providing quality services have been recognized by a 'Gold Star'. A checklist of quality-of-care indicators was developed and facilities meeting and maintaining these standards of quality were awarded a Gold Star and associated benefits. The programmatic goal is to encourage clients to seek out such facilities and then to reward the facilities for the increased client load. A series of TV spots was shown between 1997 and 1998 to inform the public about Gold Star. Under direction of the SIS, CAPMAS (the government statistical agency) undertook a nationwide survey to judge the impact of this campaign. This involved a baseline (or pre-test) survey of roughly 1000 men and 1000 women aged 15–49 in 1995 and a follow-up (or impact) survey in 1998 after the campaign was aired. The study found that 50% of the respondents recalled the Gold Star messages, and 90% of these correctly understood that Gold Star meant higher quality services. However, about 90% of the women who lived in a village with a Gold Star clinic were aware that their local clinic had a Gold Star, and only 10%

recalled seeing a Gold Star in the clinic they used (CAPMAS, 1998; Brancich *et al.*, 2001). Most of the respondents reported also that their perceptions of methods and care-providers were not changed by the campaign.

The Dr Karima Mukhtar campaign. This series of dramas centred on a woman doctor answering questions about family planning. It was aired during the 1995–96 period when the newly available injectables were being widely introduced for the first time and was explicitly aimed at explaining the method and educating clients about benefits and possible side-effects. No impact–evaluation survey was done of this campaign, but the effects seem to have been positive. The 1995 EDHS (National Population Council, 1995) reported 2·4% of current users using the injectable, while in 1997 the injectable accounted for 3·9% of current users, roughly a 60% increase in 2 years (CAPMAS, 1998).

The Ahmed Maher male responsibility campaign. This series was also aired in the 1995–1996 period and aimed at conveying the importance of men accepting responsibility for family planning as well as women. No impact studies were done of the Karima or Ahmed Maher campaigns but the Gold Star impact study found that over 70% of the respondents remembered the Karima Mokhtar 'injectables' campaign; and some 45% remembered the Ahmed Maher 'male responsibility' campaign (CAPMAS, 1998; Hess, 1998a).

These four campaigns make up the family planning behaviour change IEC thrust during the period 1995–1997 and provide the data for the application of this study's cost framework to the Egyptian BCC experience.

Campaign-specific BCC costs

The campaigns listed above involved mostly the direct cost to the SIS of planning and developing the media materials used and the cost of the actual air time. Typically the planning and development was done under contract by a private sector firm and the air time costs were at a reduced rate but, since much of this cost was supported by the USAID Mission in Egypt, good accounting is available and both are known with complete certainty. Some external technical assistance (personnel and consultants) from the Johns Hopkins University Center for Communications Programs (CCP) was provided for planning and evaluating the several campaigns and, in principle, some share of these costs should also be allocated to the cost of each campaign. However, present accounting systems in SIS and CCP do not allow allocation of time and expenses to specific campaigns, so the analysis was forced to ignore these relatively indirect costs in this first effort at approximating costs per client-impact.

Campaign-specific BCC impacts

The overall mass media effort in Egypt was a combination of these separate campaigns, but each campaign had a quite specific message-content and limited informational objectives. The 'Gold Star' campaign aimed at informing clients of the

sources for high quality clinical family planning services whereas 'Karima Mukhtar' dealt mostly with the newly available injectables; 'Ahmad Maher' stressed male responsibility and male methods; and 'Ask–Consult' focused on private sector supply sources. Impact surveys were undertaken for three of four of these campaigns with findings couched in the language of the communication literature (Wafai Associates, 1998; Hess, 1998a, b). The campaigns produced 'messages' (varying in length of time, format and content) and measured their impact in terms of 'impressions' (one person exposed to a message); 'gross values' (number of impressions without regard to the number of persons involved); 'rating points' (percentage of the potential audience reached); 'reach' (the percentage of a designated target audience exposed to at least one message); and 'frequency' (the average number of exposures per client reached). For purposes of the present study it was necessary to convert these media measures into changed behaviour of clients. To do this, each specific campaign was linked to a particular sort of behaviour change.

The overall change in behaviour (the additive impact of all the campaigns) relates to the overall rise in the contraceptive prevalence rate (CPR) from 47·9 in 1995 to 54·5 in 1997 (El-Zanaty and Associates, 1997). However, the 'impact' of each mass media Information Education Communication (IEC) campaign can be measured by the increase in the number of users of the particular course of action advocated by that campaign. In other words, the behaviour impact of each particular campaign lies in the contribution that that campaign can be shown to have made to the overall behaviour change. Impact (and behaviour change) is approached in terms of the particular message and behavioural objectives of each campaign.

Estimating the cost per unit of specific campaigns

To repeat, there are four specific campaigns for which there are available both cost and impact data. Table 1 presents a summary of the cost of these four, drawing on cost data obtained from the SIS and USAID Cairo records and including both Government of Egypt and USAID inputs.

Table 2 is based on the impact–evaluation surveys done in connection with each campaign and presents the number of airings for each campaign per year, the number of persons reached and the average number of exposures per person (CAPMAS, 1998). The average exposure data are also survey-based and the duration over which the exposure occurred is taken as one year since this is the reference period of the surveys. The Gold Star and Ask–Consult campaigns produced spots whereas the Ahmad Maher and Karima Mukhtar produced segments or 'shows'. It is assumed that the different campaigns employ messages whose length and content have been tailored to fit their objective and that, in consequence, no effort is needed to 'standardize' all messages for length or content. The evaluation surveys were designed to be random samples of the entire viewing population. The target population of the campaigns was the estimated 12·9 million currently married women aged 15–49 (22% of the estimated population in 1995 of 58,778 thousand), both as reported by the 1995 EDHS (National Population Council, 1995). However, according to the latest DHS, about 78% of the households have regular access to TV and hence only about 10 million women could under ideal conditions be reached by the campaigns. Thus,

Table 1. Estimated costs for family planning media campaigns in Egypt, 1995–1997 (costs in Egyptian Pounds: £E3·34 equal US$1·00)

Campaign	Production costs	Air time costs	Total cost
Ahmed Maher (male motivation spots, aired 1/95 to 12/96)	207,325	2,000,000	2,207,325
Karima Mukhtar (doctor's diary, aired 4/95 to 3/96)	78,000	547,600	625,600
Gold Star Clinic (informing clients of logo denoting high-quality clinic, aired 1/97 to 4/98)	172,000	1,242,418	1,414,418
PSI 'Ask–Consult' (series aimed at encouraging clients to use private sector service-providers, aired 11/97 to 10/98)	192,000	2,205,967	2,397,967

Source: Hess (1998a, b).

Table 2. Estimated campaign reach and impact: Egypt 1995–1998

Campaign	Messages aired per year	Percentage of target reached	Number of persons reached	Average exposure	Total exposures
Ahmed Maher	300	45%	4·5 million	15·0	67·5 million
Karima Mukhtar	115	70%	7·0 million	14·5	101·5 million
Gold Star Clinic	299	81%	8·1 million	14·7	119·0 million
PSI 'Ask–Consult'	276	83%	8·3 million	12·4	103·0 million

Sources: CAPMAS (1998); Hess (1998a, b).

the numbers shown in Table 3 are based on a potential target population of 10 million women. (Since the messages reach the household and these were all currently married women, the target population could also be said to be 10 million couples.)

Results

Table 3 converts the cost and the reach figures into cost per client reached and the cost per client-exposure for each of the four campaigns. (These campaigns covered slightly different time periods and while they overlapped they were not all in process at exactly the same time. As was noted above, the data have been standardized with respect to the time dimension for all these campaigns for present purposes to one year.)

The Gold Star campaign used multimedia, including print and outreach activities, as well as the TV messages. The focus was to convey information about the new clinic quality standards, the Gold Star. These clinics, for the most part, are providing IUDs

to their clients. It seems fair, in this case, to conclude that the campaign conveyed information about quality of service that was specific to the IUD. In fact, IUD use rose between 1995 and 1997 from 30% to 35% of currently married women aged 15–49, an increase of some 900,000 women. (This represents the net increase in users since some previous users discontinued while new users were being added. The same is true for all the changes in numbers of users by method in the period covered.)

The Ask–Consult campaign advertisements were recalled by some 70% of the respondents who also said that they understood from this exposure that the pill was available at pharmacies. This would amount to 3·5 million women supplied information about the pill as a specific method. The percentage of women using the pill held steady at just over 10% between 1995 and 1997, but since the overall number of clients and users rose, the absolute number of current pill users actually increased by about 75,000.

The Ahmad Maher campaign was oriented towards couples with a special emphasis on men. (The total target audience was assumed to be men in numbers equal to those of the women since TV reaches the household.) Some 45% of the men interviewed in the later evaluation survey recalled the content and message of the campaign. This resulted in an increase in the discussions of family planning between couples. Since the primary male method is the condom, it is interesting to note that condom users increased from 1·4% to 1·5% of all users, a net increase of 40,000 between 1995 and 1997.

The Karima Mukhtar campaign was even more clearly focused on the possible side-effects of the injectable contraceptive method. As was noted above, use of injectables rose from 2·4% to 3·9% in the period covered by the campaign, amounting to a net increase of over 230,000 current users. In this case, it seems even clearer that the TV campaign was successful in conveying method-specific information, which led to adoption.

Discussion

Table 3 illustrates what can be done with cost analysis when data on the costs of specific campaigns and also their airings and their reach are available. It appears that costs can be related to specific client groups using campaign and campaign objective as the conceptual linking categories. The pattern emerging from this comparison is reasonably consistent. The Ahmed Maher film was more expensive to produce and even though it was shown more often, its reach was not high, so its unit costs for a reach or exposure appear comparatively high. Its behavioural impact appears to have been minimal, with only a net increase of some 40,000 male-method users for a reach of 4·5 million. The same can be said for the Ask–Consult campaign, which increased apparent pill users by 75,000 for a reach of 8·3 million. However, both campaigns had objectives other than the boosting and/or maintenance of a particular method and this must be taken into account. The Karima Mukhtar film had low production costs and high reach, giving it a more favourable cost per unit of reach and its behavioural impact was higher: a net increase of 230,000 injectable users from a reach 7·0 million. This show promoted both adoption and longer duration of use. The Gold Star campaign evidently impacted 900,000 net new IUD users from a reach of 8·1 million,

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Table 3. Estimated media campaign costs per unit of achievement (in Egyptian Pounds)

Campaign	Cost per airing	Cost per person reached	Cost per single-client exposure
Ahmed Maher	7358	0·49	0·03
Karima Mukhtar	5440	0·09	0·01
Gold Star Clinic	4730	0·18	0·01
PSI 'Ask–Consult'	8688	0·29	0·02

Source: Tables 1 and 2.

the best impact–reach ratio of the four campaigns. Gold Star and PSI both aimed at boosting continuation rates and improving quality of services, for clinics in the former case and pharmacies in the latter case, and these objectives should be taken into account also.

Table 3 tells us something about the relative effectiveness and cost per unit of effectiveness of the four campaigns but it does not tell us that one media campaign is more cost-effective than the other, since they aimed at different behavioural achievement. What does appear reasonably clear is that the four separate campaigns each had measurable impacts on contraceptive use, each on a different method. Added up, these method-specific increases account for 1·25 million new acceptors between 1995 and 1997, approximately equal to the increase in contraceptive use in the period 1995–1997 of 1·3 million as reported in the two DHS surveys. However, it is also quite likely that for many clients the four method-specific BCC campaigns were tapping into and relating to already half-formed preference patterns and simply triggering a decision that was waiting to be made.

There appears also to be an additive or combined impact of all the campaigns on knowledge, behaviour and intentions. It seems a fair implication that these campaigns supplied new knowledge to about 5 million women. In both cases, over 90% of those recalling the messages approved of the content. A combined impact of all media exposure is also suggested by the 1997 DHS, which found that 90% of women reported exposure to family planning messages on TV, but much lower proportions reported exposure to specific campaigns. This suggests that high recall and clear understanding of the messages results from the total of all exposures rather than the exposure to any single campaign message.

An overall impact on behaviour is clearly indicated. Using the parameter indicated above of 10 million married Egyptian women viewers of reproductive age (some 12·5 million such women in the country with about 80% being regularly exposed to TV) as the potential maximum reach, the surveys indicate that both the Gold Star and Ask–Consult campaigns reached about 50% of this potential population.

Intentions were also affected. Some 16% of the respondents in the impact–evaluation survey reported that they probably would adopt contraception as a result of their exposure to some or all of the TV family planning messages. Taking as a base

the 1995 'eligible not using' and, allowing for the increase in the number of eligible women occurring in the period 1995–1997, this 16% would come to about 1·6 million new acceptors, which is higher than the actual increase of 1·3 million in the number of current users between 1995 and 1997. On the other hand, some of those influenced may have adopted after the 1997 EDHS.

Using these data for the 2 years covered by these campaigns, it appears that 12 million Egyptian pounds (£E) (2 years at the rate shown for one year in Table 1) were spent on the mass media campaigns. Overall expenditures on family planning during this period averaged about £E80 million, so the BCC component was about 15% of the total, a figure in line with similar programmes elsewhere (Piotrow, 1994). This would come to about £E10 (or about US$3·00 at the then current exchange rate of US$1·00 equal to £E3·34) per added family planning user (as reported in the DHS), ignoring the coincident impact of these expenditures on knowledge and approval of future new users. In other words, it costs £E10 to give a client sufficient knowledge and motivation to lead them to seek out and adopt a method of contraception. A previous cost-effectiveness analysis had estimated that some 3·8 million 'couple-years-of-protection' (CYP) were produced by the programme on average in the years under study, which combined with overall programme costs of some £E80 million indicates an overall supply cost of £E20 (or US$6·00) per CYP (USAID, 1997, p. 19). The two approaches to looking at the cost of programme components are thus complimentary. (The overall costs per CYP or per client-impact do not appear too far out of line with other such estimates found in earlier studies; see: Piotrow, 1994; Robinson, 1979; Janowitz, 1994.)

Conclusions

Egypt was chosen as a case-study of how far it might be possible to carry a retrospective cost-impact analysis of communication intervention activities. The results indicate that estimates for cost per unit analysis can be obtained when campaign-message-specific cost and impact-survey data are available. These estimates then provide the needed inputs for a client-oriented behaviour change impact analysis. 'Behaviour Change Communications' (BCC) campaigns, with clearly distinct messages, can be linked to different types of behaviour change.

The next logical step would be to estimate the cost per client-reach and client-exposure with a given message using some other possible approaches to changing client behaviour – interpersonal communications and community mobilization, for example – so these could be compared with the per unit cost of the mass media campaign. This step was not part of the present exercise but the framework developed lends itself very easily to this extension. Taking the analysis this far at least demonstrates the workability of the methodology and its potential for programme analysis. Moreover, even where the data base is good, as is the case in Egypt, additional questions would be required in the surveys to obtain estimates of all the change in underlying client knowledge, attitude and behaviour required to do a full-blown CEA within the framework laid out by detailed frameworks such as the 'Steps to Behaviour Change' (SBC) model. These additional dimensions centre around measures of intensity and duration and could, in fact, be obtained with only modest

changes in the impact surveys. Similar changes in the DHS instrumentation could also yield such estimates, which could then be linked to the campaign-specific data so as to yield estimates of the cost per client at the several stages of the SBC, and implicitly the cost of moving a client across the spectrum envisaged by the SBC framework.

In summary, several important points emerge from this preliminary application of the new approach. Firstly, it is possible to calculate the cost per unit of behaviour change rather than per unit of services delivered, but to do so communications campaigns must be seen as focused on specific types of behavioural change and not simply as achieving general exposures or impact.

Secondly, the key is to think of all programme activities as being broken down into a series of finite campaigns each with specific behavioural objectives and to organize both programme cost input data and programme impact evaluation data in terms of campaigns and clients rather than commodities, services or installations.

Thirdly, considerable data are required for such analysis and these may not typically be available in developing nations. On the other hand, collecting data to evaluate these approaches would add very little complexity to DHS and impact surveys already routinely undertaken for evaluation purposes in numerous countries.

Lastly, if one accepts that the 'steps to behaviour change' paradigm also describes the process by which other types of health programme interventions work, then the BCC framework described above could also be applied to HIV–AIDS and other health-behaviour-modifying communications interventions.

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