DRUG CONSUMPTION PATTERN IN URBAN AND RURAL AREAS OF INDIA AND THEIR HEALTH IMPLICATIONS

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Abstract

It is well recognized that a mix of public health, preventive, simple curative and referral facilities through primary health care (PHC) system is the right policy for public expenditure on health in developing countries. National drug expenditure as a proportion of total health expenditure in developing countries varies from 7 to 66%. Rational use of drugs is, therefore, important and essential to acquire proper medicines and dispense them in public health care systems. In recent years, the cost and expenditure on drugs have increased enormously. It is essential, therefore, to ensure that the drug used should match the burden of diseases and essential needs. Prescribing, dispensing and utilization surveys are prerequisites to rational drug use. It is estimated that 80% of the running cost of a PHC in developing countries pertains to drugs. Several urban and rural prescription audits indicated that though the mean number of drugs prescribed is around 2.4, vitamins and minerals, antibiotics, analgesics and anti-inflammatory drugs account for more than 80%. A large majority even in rural segments goes to the private health care providers. Irrational prescriptions are often seen. The drugs ordered both on doctor’s prescription and by self appear to be more or less similar. Scheduled drugs are also purchased without prescriptions, which is a cause for concern. However, in the rural segment, self-medication rate was much lower. Educational status is an important determinant of self-medication. There was a large gap between the precepts and practices of medical practitioners. The prescriptions were often incomplete with no provisional diagnosis, name, age or sex of the patient and details regarding the dosage schedule (strength per dose and duration of treatment). Pharmacists’ advice, which may be preferable to self-medication, was sought more often by patients in rural areas. Wherever there was central procurement of drugs and the distribution process streamlined, the drugs were prescribed by generic names and supplied in strip packing with labeling and these were mostly essential drugs. However, vitamin mineral mixtures and injectables were often abused. The consultation and dispensing time were too short at the PHC and community health centres (CHC). Essential drug list was not available at the periphery. An intervention strategy carried out in Andhra Pradesh impacted knowledge, awareness and practices of patients. It is suggested that the WHO – INDIA essential drug program of Delhi society for promotion of rational use of drugs (DSPRUD) be replicated throughout the country with appropriate standard treatment guidelines in order to improve drug procurement, prescriptions and utilization. The private health care has to be improved
in quality to cut down expenditure on drugs and promote rational drug therapy. Interventions to rectify over prescriptions of antibiotics in inadequate dosages and vitamins particularly injectables are needed. Essential drug list, standard treatment guidelines and training programs on rational drug use are needed. The public has to be informed on generic versus brand names and given a clear prescription with appropriate written advice. They should be appraised to buy only over-the-counter (OTC) drugs and refrain from buying scheduled drugs. It is also important to know that nutrition cannot be built across the pharmacy counters. Legislation and its implementation are mandatory as drugs are double-edged swords and account for a major out of pocket health care cost. The government must ensure availability of essential drugs and supplies and easy access to PHC centers and provide quality care.

Introduction

It is a well recognized and accepted fact that a mix of public health, preventive, simple curative and referral facilities through PHC system is the right policy for public expenditure on health in developing countries. One of the important considerations is the availability of essential cost effective drugs, which are affordable and free from adverse effects. There is a need for a coordinated and concerted effort to meet the health needs and demands. In this scenario, doctors and drugs play an important role. The pentagon of forces (the five P’s) plays a significant role in the overall production, distribution and delivery of these active molecules. They are the physicians, patients, pharmacists, pharmaceutical industries and policies, which all together can channelize the available resources towards a healthy environment, to improve drug therapy from PHC to tertiary hospitals health care.

The public health expenditure in India has declined from 1.3% of gross domestic product (GDP) in 1990 to 0.9% of GDP since 1999. Union government contribution to public health expenditure is over 15% while states contribution is about 85%. Over 25% of hospitalized Indians fall below poverty line because of hospital expenses and over 40% of hospitalized Indians borrow or sell assets to cover expenses. Currently the public health spending on health is 0.9% GDP (federal government 0.29% and state government 0.61%) and is expected to increase to 3% by the year 2009.

A unanimous consensus is that primary health care is not being implemented properly1. A recent analysis of PHC, in general, indicates that

- perception that “free care” is of low quality,
- the infrastructure is of poor quality and there is lack of even basic drugs and diagnostics,
- even the available infrastructure is grossly under-utilized as quality health care is lacking,
- it is marked by endemic absenteeism and neglect on the part of health care providers,
- monitoring and accountability are non-existing,
- even private sector is largely unregulated and there is no gate keeping on standards of clinical practice,
- several rural health posts remain vacant, public health care therefore, fails to get delivered,
- the health sector lacks systematic efforts to track the health system and health facilities,
- there is no periodic evaluation of health personnel on their technical competence and ability to provide medical health care,
- there is no surveillance system,
- the rural health care structure is extremely rigid making it unable to respond effectively to local realities and political interference decides the location of health facilities, which often results in irrational distribution of PHC and sub-centres,
- the district health officers lack training in public health management,

There is a large dependence on the private health care system, most of which comprises of untrained rural medical practitioners. A recent survey in UP and Bihar indicated that while over 50% of those surveyed consulted untrained health care providers, only 5.2% of all those who were surveyed consulted a government doctor.¹

A survey in North India on morbidity, hospitalization and private expenditure by the poor indicated that the illnesses reported are simple ailments such as gastro intestinal tract disturbances, respiratory problems and common ailments (63%). In children, fever, respiratory problem and diarrhea predominated the scene. The existing level of PHC services provided to the rural population showed large gaps between required and sanctioned posts (indiastat.com).

**Drug consumption on India**

A remarkable increase in use of drugs is seen in almost every country. Modern medicaments tend not only to be expensive but also add appreciably to the cost of health services. The medical, social and economic consequences of drug utilization are equally important issues, which need evaluation from time to time. It is necessary to ensure that drug use in a community is congruent with drug needs and confers maximum therapeutic benefits and minimal adverse reactions. A therapeutic audit is required at all levels of the therapeutic chain to ensure safe and effective medical care. Medical doctors, pharmacists and public will be needed to assess both the risks and benefits of drugs in a broad perspective.

**NIN studies on drug consumption pattern**

The National Institute of Nutrition, Hyderabad attempted to quantitate drug consumption pattern and followed it up with studies both in urban and rural segments.² Consumer collecting drugs across the counter is
an accurate source of information about the drugs that are prescribed and purchased. Therefore, a study was conducted in Hyderabad and Secunderabad in the state of Andhra Pradesh and 10% of drugs outlets registered in twin cities were covered by activity sampling technique. The complete sales of selected druggist of 1 day were covered over a 1-month period. In a period of 4 months the activity of each druggist was covered for 4 complete days.

**Doctors’ prescription pattern**

The survey brought out certain concerns in the prevalent practices. The doctors prescription accounted for 51.3% as against self-medication rate of 46.9%. The mean number of drugs ordered was significantly higher among prescriptions by doctors (2.11±1.24) than in self-prescriptions (1.43±0.8). Among doctors’ prescriptions 26.5 % of prescriptions had 3-4 drugs; 4.3% had more than 4 and 69.5% had fewer than three drugs. The profile of prescription by doctors has showed that there is a big gap between precept and practices. Several doctors have not mentioned their professional qualifications; 90.5% were in private practice. Hardly 42% of prescription had patient name and only 2% had the provisional diagnostics. Drug doses were mentioned in 29.3% of prescriptions only. Among antibiotic prescriptions, where several dosages were available, only 36% of doctors mentioned dose.

**Categories of drugs used**

The categories of drugs which were sold across the counter on self request and doctors orders were more or less similar; nutritional products topped the list in doctors orders, followed by antibiotics and analgesics / antipyretics / anti-inflammatory drugs. Drugs used for GI tract disturbances and respiratory disease were around 8-12%. Of the total nutritional products, vitamin B complex preparations topped the list (42%), multivitamins / multiminer combinations were 12% and hematenics formed 12%. Among self-requests analgesics and anti-inflammatory drugs accounted for 23.8%, followed by nutritional products (9%). In 15.8% of prescriptions by doctors contained more than one B complex preparations and there were three in 2% of prescriptions. Among self-orders 32.8% were for analgesics followed by nutritional products (26.5%) and drugs for GI disturbances. The percentage of scheduled drugs procured for self-medication was 59%. Among over-the counter (OTC) drugs nutritional products were extensively purchased; scheduled analgesics such as analgin, proproxphene available to the public without prescription (17%).

**Problem in prescription orders**

The prescription order is a therapeutic transaction amongst physicians and patients and chemists. Incomplete prescriptions and over consumption of certain available medicaments by patients without
doctor’s consultation are serious problems. When it is incomplete, irrelevant, non-compliance may hinder treatment. Though self-medication is an alternative to consulting a doctor even safe drugs may not remain safe. Among nutritional products the combinations purchased are of vitamin B1, B2, B6, niacin and vitamin B12. On the other hand, while anemia is widespread, purchase of hematanics both on doctors prescription and self-request is quite low. The absence of dosage regimen in doctors orders results in inadequate procurement and consumption of drugs. When antibiotics course is not completed it results in bad trial resistance. Among doctors prescriptions 40% had antibiotics prescribed for 5 days, 41% for 1-3 days and 7.2% for 1 day. On the other hand 30% of self-medicators purchased antibiotics for less than a day and only 18% purchased for 5 days.

**NIN studies on drug consumption in urban and rural area.**

A second study of NIN compared the drugs utilization pattern between urban and rural areas. The data was collected from 26 retail pharmacies in 3 urban zones with 25 to 30 villages from 4 rural areas with PHCs. Patients visiting the pharmacies were interviewed about the nature and duration of symptoms. Two physicians independently assessed the appropriateness of drugs prescribed.

There were no significant differences in drug usage between urban and rural areas and in relation to socio economic status. In both urban and rural areas low-income group population made most purchases and 75-89% of the people were illiterates. The self-medication rates were high in urban areas. While income levels had no effect, literacy had significant effect on self-medication rates. Around 76% of literates resort to self-medication. Cost of drugs was higher in urban areas both on doctors' prescription and self-medication.

Both in urban and rural areas, analgesics, anti-inflammatory drugs, sulphonomides and other antibiotics and nutritional products accounted for more than 50% of prescription sales. Anti-tubercular, anti-malarial, anti-fungal drugs accounted for 25% in urban and 3% in rural areas. Purchase of food supplements on doctors advice were higher in rural than of urban areas. On the basis of WHO list of essential drugs, 47% and 60% of drugs prescribed in the urban and rural areas respectively could be classified as non-essential. The largest single group of OTC drugs was topical agents in rural areas and analgesics / anti-inflammatory agents in urban areas. In both 42-46% purchases were for conditions that had begun less than 24hours earlier, while 19% were for chronic illnesses. Both in urban and rural areas 56-61% were for vitamin B-complex preparations and 11-17% were for hematenics.

In urban and rural areas, 61-67% over the counter sales for antihypertensives on were self-medication while, 16-25% was on doctor’s orders. It was observed that only 38% to 46% of prescriptions were relevant to patient’s symptoms; only 56% of patients purchased
all prescribed drugs in urban area as compared 80% in rural areas. The reasons were financial constrains and non-availability of certain drugs. Inappropriate prescription reduces the quality of medical care and leads to waste of resources. The economic consequences of irrational prescriptions are severe and result in purchase of inadequate or irrelevant drugs. The pharmacist needs to adopt a more professional attitude than just business attitude to improve the purchase of prescriptions. Better awareness about proper medication is essential for doctors, pharmacists, manufacturers, governmental agencies and consumers to achieve rational use of drugs (RUD).

**Studies from Varanasi**

A household survey in rural Varanasi showed that out of 338 morbidity episodes, 226 were treated at some health care facilities. From available prescriptions, injections were given in 10%. In all, 43% contained one antibiotic, 70% of private practitioners prescriptions contained antibiotic. Overall 63.33% prescriptions were found to be irrational.

**Studies from Pondicherry**

It is estimated that 80% of the running costs of a PHC in developing countries are on drugs. Recently a study was done in two PHC in Pondicherry. Information on complaints, diagnostics and drugs prescribed were collected. The public health care system in Pondicherry is a state run project, in which the entire expenditure is borne by the government and the general population uses the services. Data was collected for about half of the patients attending the PHC on a randomly selected day in each month from January to December. The average number of drugs were around 2.7 / patient. The most common prescribed drugs were vitamins (24.7%), anti-microbial (24.3%), analgesics (19.9%), anti-histaminic (10.3%) and anti-diarrheals (3.2%). The common symptoms were similar to that reported in northern part of India. The common clinical diagnosis was wound infection (20.5%) followed by myalgia, upper respiratory tract infections and skin disorders. Though vitamin B complex and iron were prescribed neither anemia nor vitamin deficiency were among the most commonly made diagnosis. Majority of patients received antibiotics (60%). Sulphanamides were the commonly prescribed accounting for 47.5% of all antimicrobial. Tetracycline injections were common. However, the most common intramuscular preparation was vitamin B complex followed by antibiotics and analgesics. It is to be noted that vitamins were used as placebo. The rational for use of Injections cannot be explained.

**Studies from Vellore**

A study in the Christian Medical College, Vellore in a base hospital showed that each patient received 1-7 drugs with a mean of 2.4±1.1. 
The most common drugs were vitamins analgesics, antibiotics, sulphonamides and anti-inflammatory agents with a mean cost of Rs 8.80. All the drugs were from WHO essential drug list.

Our own experience in Andhra Pradesh to evaluate consumption pattern of drugs at various PHC, mandal and district hospitals to develop an intervention study to improve rational drug programme was similar to that of Vellore study\(^7\). We have followed WHO criteria of prescribing, patient care facility and communication indicators. In AP currently procurement of drugs is centralized and Andhra Pradesh Vaidya Vignan Parishad headed by project director belonging to government of AP to procure the bulk drugs. He is also responsible for distribution (80%) of drugs through AP Health Medicine Housing Development Corporation. The drugs are labeled under generic name. There is a quality control programme and monitoring and most drugs are in strip packing.

The categories of drugs prescribed were similar to our urban study. Among antibiotics, penicillin topped the list both in PHC and CHC. Each patient spent 1.3±0.18 minutes on the doctor and the pharmacist. Almost 80-90% of patient demanded injections with vitamin B complex topping the list. The reasons for receiving injections depended upon perception that they will provide rapid relief. Provisional diagnosis was seen in 11% of prescriptions. Most of the drugs prescribed are by generic name. Among the categories of drugs 20% were for antibiotics, 14% for nutritional products, 30% for antipyretics and 36% miscellaneous drugs. The prescriptions showed poor doctor patient interaction and preference for injections. The facility indicators suggested poor dispensing and non-availability of essential drugs while the communication indicator suggested keen interest in folk media. The awareness of drug was very poor. A pilot intervention programme consisting of folklore, a tale told with music and dance in local language and brochures to improve rational use of drugs to reduce rational demand for injections and rational use of antibiotics by focus group discussions was conducted. The audio-visual display and communication packages were well accepted. A post intervention evaluation suggested that the knowledge and practice could be considerably improved. The demand for injections became less and use of antibiotics was more rational at the PHC. However, in private practice the use of injections continued. Repeated interventions could have had better impact.

*Rational use of drugs (DSPRUD)*

Recently the DSPRUD in collaboration with WHO, has initiated training programs for RUD\(^5\). They prepared essential drugs list and standardized treatment guidelines with promotion of ethical drugs advertisement. A model for pooled procurement of drugs for all hospitals was created with an inbuilt monitoring and evaluating system. An effective programme of inspecting the pharmaceutical factories with
good manufacturing practices and quality assurance was established. This Indo-WHO programme was replicated in other states and appears to have had good impact on drug utilization pattern in hospitals.

**Studies on national drug policy**

The administrative staff college of India in collaboration with Karolinska Institute, Sweden carried out a study on the national drug policy and use of drugs in Andhra Pradesh. Only 65% of the drug outlets were inspected and 78% of drugs were collected for testing. The salient finding suggested that out of pocket expenditure is on drugs. The number of drugs from the national essential drugs list was 49%. The value of drugs procured in the public sector was 85%. The poorly organized drug distribution network in rural areas resulted in non-availability of essential medicines. Storage facilities in private outlets in rural areas were poor and this may adversely affect quality of drugs.

**Conclusion**

The major conclusions that can be drawn from such studies are that

- the providers and patients must be exposed to rational drug therapy with emphasis on essential drug list
- cost effective management to reduce overall expenditure on drugs
- emphasis of public sector should be on life saving drugs.
- pharmaceutical products are marketed with little concern for different needs and are being promoted by generating demand among prescribers and consumers.

Health care in India outside public sector is provided by people ranging from untrained personnel to highly accomplished trained professionals. Patient’s pressure for rapid relief results in wide spread use of steroids and injections which produce an early sense of well-being. All scheduled drugs are freely available over the counter. Inappropriate use of drugs leads to drug resistance and may result in undocumented adverse drug reactions. Strict enforcement of existing laws would greatly improve purchase from pharmacy outlets.

**Strategies to improve quality of health care**

A good drug policy and price control with appropriate regulation of manufacture, sale and distribution will have positive benefits on drug use, provided both the public and private health care providers are exposed to RUD through consumer awareness programmes.

- As drugs are instruments of public health, appropriate modifications are needed in medical curriculum to improve knowledge on drug use for medical personnel.
- Information technology can be used to improve the performance of public health facilities.
Simple monitoring of drug use, standard treatment guidelines, essential drug list (evidence based), pharmacy / therapeutic committees, targeted in-service training and public education are some simple measures to promote RUD.

If such strategies are followed, the quality of health care can be improved considerably and expenditure on drugs can be reduced. A drug information system is needed with pharmaco-epidemiological studies paving way for streamlining system from production to consumption at different levels of health care. Legislations and regulations must be realistic and implementable. District level monitoring and drug auditing will have a positive impact on drug use in rural India. To further energise the public health programme, public health management has to be toned up with feedback mechanisms, accountability, local oversight and community involvement. National drug policies must be developed through an open participatory process, involving health professionals, consumers, academia, industry and other concerned parties. It should be evidence based and tailored to national needs.

References

1. Bajpai N, Dholakai RH, Sachs JD.: Scaling up primary health services in rural India. CGSD working paper no 29, Nov 2005


DRUG UTILISATION PATTERNS IN URBAN AND RURAL AREAS AND THEIR IMPLICATIONS

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Hyderabad.
A General opinion on public health care - I

- Perception of “free care” is of low quality
- The infrastructure is of poor quality and there is lack of even basic drugs and diagnostics
- Even the available infrastructure is grossly under utilized as quality health are is lacking
- It is marked by endemic absenteeism and neglect on the part of health care providers.
- Monitoring and accountability are non-existing
- Even private sectors are largely unregulated and these is no gate-keeping on standards of clinical practice
- Several rural health posts remain vacant. Public health care therefore fails to get delivered

Providing regular supplies of ED at low cost is essential and integral component of PHC
A General opinion on public health care - II

- The health sector lacks systematic efforts to track the health system and health facilities.
- There is no periodic evaluation of health personnel on their technical competence and ability to provide medical health care.
- There is no surveillance system.
- It is also said that the rural health care structure is extremely rigid making it unable to respond effectively to local realities and needs.
- Political interference in the location of health facilities often results in irrational distribution of PHC and sub-centres.
- The district health officers also lack training in public health management.
- There is a large dependence on the private health care system (50%) and only 5.2% consults public sector doctors.
PROFILE OF INDUSTRY

- PHARMACEUTICAL INDUSTRY
  - Annual growth at over 10% for the last decade.
  - Global ranking of Indian Pharmaceutical industry – 4th by volume, 13th by value.
  - Products sold to over 100 countries.
  - 9274 manufacturers, 3908 loan licensees, 3.5 lakh sales outlets
  - Growing emphasis on Quality Control of Drugs.
    - 40,000 Samples tested annually
    - Results delayed for 3-4 months
    - Imported drugs not tested

Bhushan R, Presented at NIN 2006
### Trends in Public Health Expenditure in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Health Expenditure as % of the GDP</th>
<th>Per-Capita Public Expenditure on Health (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenue</td>
<td>Capital</td>
</tr>
<tr>
<td>1950–51</td>
<td>0.22</td>
<td>NA</td>
</tr>
<tr>
<td>1955–56</td>
<td>0.49</td>
<td>NA</td>
</tr>
<tr>
<td>1960–61</td>
<td>0.63</td>
<td>NA</td>
</tr>
<tr>
<td>1965–66</td>
<td>0.61</td>
<td>NA</td>
</tr>
<tr>
<td>1970–71</td>
<td>0.74</td>
<td>NA</td>
</tr>
<tr>
<td>1975–76</td>
<td>0.73</td>
<td>0.08</td>
</tr>
<tr>
<td>1980–81</td>
<td>0.83</td>
<td>0.09</td>
</tr>
<tr>
<td>1985–86</td>
<td>0.96</td>
<td>0.09</td>
</tr>
<tr>
<td>1990–91</td>
<td>0.89</td>
<td>0.06</td>
</tr>
<tr>
<td>1995–96</td>
<td>0.82</td>
<td>0.06</td>
</tr>
<tr>
<td>2000–01</td>
<td>0.86</td>
<td>0.04</td>
</tr>
<tr>
<td>2001–02</td>
<td>0.79</td>
<td>0.04</td>
</tr>
<tr>
<td>2002–03</td>
<td>0.82</td>
<td>0.04</td>
</tr>
<tr>
<td>2003–04</td>
<td>0.85</td>
<td>0.06</td>
</tr>
</tbody>
</table>

*Note: GDP is at market price, with 1993–94 as the base year*

*Sources: Report on currency and finance, RBI, various issues; Statistical abstract of India, Government of India, various issues; Handbook of statistics of India, RBI, various issues*
## Morbidity, Hospitalization and Private Expenditure by the Poor on Healthcare in Unnao and Raisen Districts

<table>
<thead>
<tr>
<th>Item</th>
<th>Unnao (UP)</th>
<th>Raisen (MP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Population falling sick during last year</td>
<td>14.24</td>
<td>16.52</td>
</tr>
<tr>
<td>% of Population hospitalized during last year</td>
<td>5.97</td>
<td>8.43</td>
</tr>
<tr>
<td>% of the sick visiting Public Health facility</td>
<td>22.30</td>
<td>17.45</td>
</tr>
<tr>
<td>% of the sick visiting Private Health facility</td>
<td>77.70</td>
<td>82.55</td>
</tr>
<tr>
<td>Rating on 0-6 scale of Public Health facility</td>
<td>2.10</td>
<td>2.05</td>
</tr>
<tr>
<td>Rating on 0-6 scale of Private Health facility</td>
<td>2.32</td>
<td>2.73</td>
</tr>
<tr>
<td>Average per capita family expenditure on health (in Rs.)</td>
<td>187.41</td>
<td>150.88</td>
</tr>
<tr>
<td>% of Income spent on health</td>
<td>13.51</td>
<td>9.09</td>
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</table>

### Illness Pattern among the Poor in Raisen (MP) and Unnao (UP)

<table>
<thead>
<tr>
<th>Illness</th>
<th>Unnao (UP)</th>
<th>Raisen (MP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>24.2%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Stomach related</td>
<td>28.9%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>05.3%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Chronic</td>
<td>22.1%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Others</td>
<td>16.8%</td>
<td>09.3%</td>
</tr>
<tr>
<td>Malaria</td>
<td>02.7%</td>
<td>07.6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0 %</strong></td>
<td><strong>100.0 %</strong></td>
</tr>
</tbody>
</table>

### Official Estimates of Shortfall in Health Personnel in Rural Areas of MP and UP (2001)

<table>
<thead>
<tr>
<th>Post</th>
<th>Required (R)</th>
<th>Sanctioned (S)</th>
<th>In Position (P)</th>
<th>Vacant (S – P)</th>
<th>Shortfall (R – P)</th>
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<tbody>
<tr>
<td><strong>Madhya Pradesh</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Specialist Doctors (Surgeons, OB &amp; GY, Physicians, Pediatricians)</td>
<td>1368</td>
<td>485</td>
<td>100</td>
<td>385</td>
<td>1268</td>
</tr>
<tr>
<td>Health Assistants – Female</td>
<td>1690</td>
<td>2160</td>
<td>1558</td>
<td>602</td>
<td>132</td>
</tr>
<tr>
<td>Health &amp; Multipurpose worker (MPW) – Male</td>
<td>11947</td>
<td>11755</td>
<td>11230</td>
<td>525</td>
<td>717</td>
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<tr>
<td>Multipurpose Worker – female/ANM</td>
<td>13637</td>
<td>12774</td>
<td>10426</td>
<td>2348</td>
<td>3211</td>
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<tr>
<td><strong>Uttar Pradesh</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist Doctors (Surgeons, OB &amp; GY, Physicians, Pediatricians)</td>
<td>1240</td>
<td>1152</td>
<td>577</td>
<td>575</td>
<td>663</td>
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<tr>
<td>Health Assistants – Female</td>
<td>3808</td>
<td>4017</td>
<td>3544</td>
<td>473</td>
<td>264</td>
</tr>
<tr>
<td>Health &amp; Multipurpose worker (MPW) – Male</td>
<td>20153</td>
<td>9935</td>
<td>8570</td>
<td>1365</td>
<td>11583</td>
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<tr>
<td>Multipurpose Worker – female/ANM</td>
<td>23961</td>
<td>23645</td>
<td>22629</td>
<td>1016</td>
<td>1332</td>
</tr>
</tbody>
</table>

Source: www.indiastat.com

Source: CGSD Working Paper No. 29, 2005
Sequence of presentation

- Urban drug audit
- Urban / rural drug audit
- Drug availability at PHC
- Results of intervention study
- Studies from Pondicherry and Varanasi PHC
- Administrative staff college and Karolinska Institute studies
- India WHO Programme of Essential Drugs
- Suggestions for Rational Use of Drugs
Drug orders sold across the counter
Urban Area

Self 46.9%
(1.43 +/- 0.81) *

Pharmacist 1.8%
(1.25 +/- 0.47) *

Doctor 51.3%
(2.11 +/- 1.34) *

Total no of prescriptions = 47,513
* P < 0.001
Percentage distribution of drugs on doctor’s prescription /self medication

ED 35%
## Salient Features of Drug Audit

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile of prescriptions</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>B-complex / Multivit.</td>
<td>42% / 12%</td>
</tr>
<tr>
<td>Hematinics</td>
<td>12%</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>80%</td>
</tr>
<tr>
<td>Sedatives / tranquilizers</td>
<td>66%</td>
</tr>
<tr>
<td>Antidiarrhoeals</td>
<td>32%</td>
</tr>
<tr>
<td>Antibiotics &amp; sulpha</td>
<td>79%</td>
</tr>
<tr>
<td>Doses</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Advice</td>
<td>1%</td>
</tr>
<tr>
<td>Scheduled drugs on (SM)</td>
<td>58%</td>
</tr>
</tbody>
</table>
Percentage distribution of dose and dosage scheduled of antibiotics and sulfa

- **Strength mentioned**: 26
- **Dose Mentioned**: 35.9

- **Less than 1 day**: 30.1
- **1-3 days**: 39.1
- **4 days**: 12.8
- **More than 4 days**: 17.9

* p<0.01 by normal proportion test
DRUG CONSUMPTION PROFILE - Urban Rural Comparison

( ) Drugs per prescription

Education status

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Patients with Prescription (n=1680)</th>
<th>Patients with Self medication (n=693)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban (n=863)</td>
<td>Rural (n=817)</td>
</tr>
<tr>
<td>Illiterate</td>
<td>37</td>
<td>63</td>
</tr>
<tr>
<td>Literate</td>
<td>63</td>
<td>37</td>
</tr>
</tbody>
</table>

Income no significant effect
Literacy influence self medication – 76%
Food supplements were purchased liberally in rural areas.
Percentage distribution of prescription-only and over-the-counter drugs among patients in urban & rural areas

Urban
Self - 40%

Rural
Self – 18%
Relevance to the Disease

Drug Consumption Profile - NIN Studies

- Relevant: 46
- Relevant - Over prescription: 14
- Irrelevant: 40

- Relevant: 32
- Relevant - Over prescription: 30
- Irrelevant: 38
Reasons for incomplete purchase of prescribed items in urban and rural areas

- The percentage of the total number of incompletely purchased prescriptions within the urban or rural setting
- Preliminary therapeutic testing refers to the purchase of a small quantity of the drug for self-evaluation of its therapeutic efficacy
Health Sector Reforms (1998), Government of Andhra Pradesh

- Directorate of Medical & Health, Govt. of A.P.
- Secretary
- Govt. of A.P.
- Health Medical & Family Welfare
- Directorate of Medical Education, Govt. of A.P.

Centralised Drug Procurement

80/20

Distribution

A.P. Health, Medicine & Housing Development Corporation
- Single source Drug Procurement
- Properly labeled - generic name
- Constant quality control monitoring
- Strip packing
## STUDY DESIGN

**Selection of Health Facility**  
- Primary Health Centre (PHC),  
  Community Health Centre (CHC)  
  District Hospital (DH)

**Criteria**  
- Three districts from three regions  
  Socio-culturally distinct  
  Away from Medical College Hospitals
AREAS OF OPERATION

Telangana Nizamabad: PHC (1438), CHC+AH (425), Dist Hospital (512)

Rayalaseema Cuddapah: PHC (478), CHC+AH (119), Dist Hospital (181)

Andhra W.Godavari: PHC (448), CHC+AH (155), Dist Hospital (150)

( ) are no. of prescriptions

Criteria - Three districts from three socio-economic cultures
Measuring the Indicators

I. Prescribing indicators
Average no. of drugs
% of cases receiving antibiotics
% of cases receiving injections
% of prescribed by generic names

II. Patient care indicators
Average consultation time (mins.)
Average dispensing time
% of prescribed drugs which are actually dispensed
% of dispensed drugs adequately labeled
% of patients knowing correct dosage

III. Facility indicators
Availability of national EDL (Essential Drug List)
Availability of key drugs (The key drugs will be based on the WHO list)
Opinion on health care centres

Outpost
Male - 42%  Female - 58%

- 72
- 70
- 53
- 14
- 29
- 14
- 12
- 60-70% < 1 Km
- 90% PHC
- Direct cases
SYMPTOMS PROFILE

NIN

<table>
<thead>
<tr>
<th>Condition</th>
<th>Outpost</th>
<th>Healthpost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen. Weakness/headache</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Body/joint Pains</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Cold &amp; Cough</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Fever</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>ANC+Gynea.</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Eye inf.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Skin inf.</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Percent

- 20.5
- 11.3
- 10.2
- 9.4
- 9.4
- 7.9
- 6.5
- 4.2
- 3.3
- 2.7

PONDICHERRY

2953 patients

Wound infection: 11.3%
Myalgia: 10.2%
Diarrhoea: 9.4%
Skin diseases: 9.4%
Pain: 7.9%
Urinary tract infection: 6.5%
Bronchial asthma: 4.2%
Cold and fever: 3.3%
Worms: 2.7%
Pyrexia of unknown origin: 20.5%
**Doctor's prescription (PHC)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Mentioned</th>
<th>Not Mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean drugs</td>
<td>-</td>
<td>2.1 ± 1.3</td>
</tr>
<tr>
<td>Provisional diagnosis mentioned</td>
<td>-</td>
<td>11%</td>
</tr>
<tr>
<td>Not mentioned</td>
<td>-</td>
<td>89%</td>
</tr>
<tr>
<td>Antenatal care</td>
<td>-</td>
<td>3%</td>
</tr>
<tr>
<td>Other diseases</td>
<td>-</td>
<td>6%</td>
</tr>
<tr>
<td>Joint pains</td>
<td>-</td>
<td>2%</td>
</tr>
</tbody>
</table>
Categories of Drugs Prescribed at PHC & CHC

NIN Studies

Outpost

- Antibiotics: 20
- Analgesics: 32
- Vitamins: 16
- Anti-allergics: 6

Health Post

- Antibiotics: 21
- Analgesics: 30
- Vitamins: 14
- Anti-allergics: 10

Mean No. Drugs 2.1
Total no. of patients = 2400

Pondicherry Study

Drugs prescribed = 8021
Including 128 patients prescribed 2 antibiotics
Mean No. Drugs 2.1

Prescriptions with at least one type of specified drug according to type of health care provider - Varanasi

<table>
<thead>
<tr>
<th>Type of Drug</th>
<th>Type of health care provider</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public (%)</td>
<td>Private (%)</td>
</tr>
<tr>
<td>Injections</td>
<td>11.11</td>
<td>10.00</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>33.33</td>
<td>70.00</td>
</tr>
<tr>
<td>Multivitamins and minerals</td>
<td>44.44</td>
<td>40.00</td>
</tr>
<tr>
<td>Analgesics and anti-inflammatory</td>
<td>. . .</td>
<td>50.00</td>
</tr>
<tr>
<td>Steroids</td>
<td>. . .</td>
<td>30.00</td>
</tr>
<tr>
<td>Total</td>
<td>30.00</td>
<td>33.33</td>
</tr>
</tbody>
</table>

REQUEST FOR INJECTIONS

Cuddapah: 87% Outpost, 14% Healthpost, 10% Rx
Nizamabad: 65% Outpost, 68% Healthpost, 35% Rx
W.Godavari: 90% Outpost, 10% Healthpost, 6% Rx
CATEGORIES OF INJECTIONS

- Analgesics: 35%
- Vaccines: 7%
- Penicillin: 24%
- Antiasthamatics: 3%
- Vitamins: 25%
- Antiallergics: 4%
- Others: 2%

Injection rate of antibiotics = 33%
B.complex = 34%
Injection rate = 48% (1406 / 2953)

Pondicherry Study
REASONS FOR PREFERING INJECTIONS

- Fast relief: 15%
- Feel better: 29%
- Visit PHC: 9%
- On others advice: 1%
- Not Applicable: 46%
Consultation Time (Doctor)

Mean consultation time (minutes)
1.4 ± 0.7

Dispensing time

Mean dispensing time (minutes)
1.2 ± 0.45

Consultation Time (Doctor)

- One
- Two
- Three
- Four

Dispensing time

- One
- Two
- Three
ANTIBIOTIC PROFILE

New Generation

Sulpha+Trimethoprim

Percent


20 30 12

Ciprofloxacin

Percent


0 3 10

Cephalaxin / amoxicillin
+ Synthetic pencillins

Percent


1.5 20 26

Tetracycillin

Percent


20 12 3

Ciprofloxacin

Percent


12 6 3
Conclusions:

- Drug procurement / Distribution process streamlined
- Generic names are used most of the time
- Strip packing with appropriate labeling

Prescription Indicators:

- High prescriptions of injections/antibiotics
- Average time spent with patient: ↓

Patient Indicators:

- Injection mania
- B-complex/antibiotics/Cough mixtures favorite medicament

Facility Indicators:

- Average dispensing time: ↓
- Non-availability of key / essential drug list
**Some facts on drugs**  
**EDL and Legislation**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of drugs outlet inspected</td>
<td>66%</td>
</tr>
<tr>
<td>No. of drug outlets in violation</td>
<td>9%</td>
</tr>
<tr>
<td>Legislation implemented</td>
<td>100%</td>
</tr>
<tr>
<td>No. of samples collected</td>
<td>76%</td>
</tr>
<tr>
<td>No. of samples tested</td>
<td>93%</td>
</tr>
<tr>
<td>No. of advertisements in violation</td>
<td>5%</td>
</tr>
<tr>
<td>Action taken</td>
<td>20%</td>
</tr>
<tr>
<td>No. of drugs from EDL prescribed</td>
<td>70%</td>
</tr>
<tr>
<td>No of EDL sold</td>
<td>48%</td>
</tr>
<tr>
<td>Value of drugs from EDL</td>
<td>85%</td>
</tr>
<tr>
<td>No of prescription with injections</td>
<td>36%</td>
</tr>
<tr>
<td>Public sector expenditure / prescription</td>
<td>Rs. 8.70</td>
</tr>
<tr>
<td>Private outlet expenditure / prescription</td>
<td>Rs. 28.93</td>
</tr>
<tr>
<td>Best selling drugs - % of EDL</td>
<td>42%</td>
</tr>
</tbody>
</table>

Source: Administrative Staff College + Karolinska Institute
Intervention programme: phase II

CME programmes
(Doctor/Pharmacist)
District/ Mandal Hospitals

Use of Social marketing approach
(Population)

I. Need based assessment
   Focus group discussion
   Key informant interview

II. Development of communication material
   Designing of material
   Use of multimedia approach
   Community participation
CONCEPT OF THE FILM

Use Only Disposable Syringes

Fewer Medicines Better Health

Use Antibiotics Only When Prescribed by A Doctor

Rational Use of Drugs Means Right Drug, Right Dose, Right Duration

FILM EXCERPTS...

Haridas' Tale of Medicine
An educational film presented in the form of HARIKATHA, a traditional folk form of A.P.
IMPACT OF VIDEO FILM ON KNOWLEDGE, ATTITUDE & PRACTICES

Note: Values indicate the % of population, who followed and described the messages.
CONCLUSIONS

To create awareness about the inappropriate use of injections & nutritional supplements among prescribers & pharmacists

- Suitable intervention methods (brochure & film) developed
- Pre-testing carried out in Nizamabad District
- Implemented intervention programme
- Substantial gain in KAP practices with reference to injectables, antibiotics and quack practices
Parameters for successful model of RUD in Delhi

1994 - State Hood - Delhi
Dr. Harshvardhan, Health minister (Former)

1995 - NGO - DSPRUD
PROF. Ranjit Roy Chaudhury

Essential Drug Selection Committee - 16 members

- EDL (Essential Drug List) - 250
- Essential Medicinal Formulary
- Standard treatment guidelines
- Training of health professionals
- Promotion of ethical drug advertisement

Source: The Catalyst Editors; K.S. Raghavan & V.S. Mathur
Constraints

- Budgetary allocations for drugs not able to match population growth ➣ per capita resources for drugs
- Escalating cost of drugs
- Poor storage facilities
- Poor quality of medicines
- Non availability of transport
- Shortage of essential drugs
- Prescribes are influenced by pharmaceutical companies
Suggestions for better use of drugs

- Achieve GMP and GLP and better enforcement of the D&C Act and Rules.
- Increased testing capacity in Govt. Labs coupled with audit of drug testing laboratories.
- Impart training to Drug Regulatory Staff, Government Analyst, Quality Control Analysts and Manufacturing Chemists of Small Scale Drug Industries.
- Indian Pharmacopoeia Commission.
- Create awareness about the rational use of drugs and monitor the adverse drug reactions (Pharmaco Vigilance)
Suggestion for improvement

- Development of efficient indenting system
- Small budget to be made available with PHC
- Training on rational drug use
- Public sector should concentrate on essential drugs
- Develop essential drug control system
- **Provide incentives for private drug industries for ED**
- Encourage non-profit organizations to produce drugs with technical support
- Standard treatment guidelines must be made available
- Establish drug information system
Thank You