PHARMACEUTICALS IN DEVELOPING COUNTRIES 1981-82

Published by
Office of Health Economics
12 Whitehall
London SW1A 2DY

1984

OFFICE OF HEALTH ECONOMICS

The Office of Health Economics was founded in 1962 by the Association of the British Pharmaceutical Industry. Its terms of reference are:

To undertake research on the economic aspects of medical care.
To investigate other health and social problems.
To collect data from other countries.
To publish results, data and conclusions relevant to the above.

The Office of Health Economics welcomes financial support and discussions on research problems with any persons or bodies interested in its work.

INTRODUCTION

Two years ago, the Office of Health Economics published a research paper describing some of the activities of eighteen European pharmaceutical companies in the Developing Countries in 1979-80 (Worlock 1982). The same small study group which collected these data have now updated the information, providing statistics for 1981-82. The new study covers a slightly larger number of companies — 22 as against 18. The statistics largely speak for themselves; however, in the text, where growth rates in activities are quoted, they refer to the increases related to the original eighteen companies' company figures for 1981-82 with the previous data for 1979-80.

The twenty-two companies taking part in the survey are listed in Appendix I.

It is clear from the study that the multi-national research-based pharmaceutical companies based in Western Europe are making a considerable contribution to health care within the Third World. This contribution has increased significantly since the previous study was published in 1982, and the companies of Western Europe are still continuing to extend their work in the Developing Countries, for the benefit of their populations as a whole.

However, it remains true - as in 1982 - that the pharmaceutical industry alone cannot solve the health care problems of the Third World, which stem primarily from poverty, an overall lack of health care resources, and, to some extent, a mal-distribution of medical care as between the towns and the rural areas. Nevertheless, the industry has been actively co-operating with WHO, and with national governments, in order to maximise its contribution to the solution of the health care problems of the Developing Countries.

TRAINING

Table 1 shows the extent to which the twenty-two companies undertook various forms of pharmaceutical training in the developing countries.

The number trained in the last 2 years increased by 24 per cent over the period 1979-80. Future growth is predicted to be slower at 5 per cent.

The trend towards shorter courses lasting less than two weeks was clear from the 64 per cent of personnel attending such courses compared to 43 per cent in the earlier survey. A corresponding decrease is seen in the courses lasting between two weeks and three months. Non-company employees now represent approximately one-fifth of those trained, compared to nearer one-eighth in the previous study.

Other changes include a greater need for training in the technical aspects of marketing, and more training taking place in Asia, Oceania and Africa, with less training in Europe and Americas.

EDUCATIONAL FELLOWSHIPS

During the two year period 1981-82 a total of 503 educational fellowships were awarded by companies included in the survey. These covered the following fields of study:

Biological Research
Medical Research
Clinical Research
Drug Research and Testing and Drug Control
Production
Toxicology
Pharmacological Control
Quality Control
Microbiological Quality Control
Medical Services
Trainee Pharmacists/Pharmaceutical Training
Scholarships at University Science/ Medical Faculty
Support for Anglo-Indian Trust Linked to University
Scholarships to Visit Other Companies/Countries
General Administration and Finance

TABLE 1 Training Programmes for Third World Countries, 1981/82

1. Numbers trained		**2. Length of training**		
Last 2 years	*Next 2 years (e)*	*<2 weeks*	*<3 months*	*>3 months*
10,071	10,575 +5%	6,476 (64%)	2,991 (30%)	604 (6%)
3. Cost of training		**4. Numbers employed**		
Total for 2 years $000	*Ave. per person $*	*By Company*	*NOT Company employees*	
13,914	1,382	7,809	2,262	

5. By activity (nos)

Production	*Storage & Distribution*	*Quality Control*	*Admin.*	*Technical Information*	*Other*
1,536	301	340	1,026	6,397	471
15%	3%	3%	10%	64%	5%

6. Training locations (nos)

Corp. HQ	*Africa*	*America*	*Asia/ Oceania*	*Europe*
1,609	1,279	2,181	4,069	1,080
16%	13%	21%	40%	10%

(e) = Estimate

PRODUCTION FACILITIES

Table 2 shows the total number of Developing Countries, and of the least Developed Countries (LLDCs) in which the European companies have located production facilities (including those run by third parties). The Table also shows the total number of production units run or controlled by the European research based pharmaceutical companies in those countries.

TABLE 2 Production Facilities of the Research-Based Pharmaceutical Industry* in Developing Countries: Members of the United Nations

Region	*Number of developing countries excluding LLDC's*	*Number of LLDC's*	*Total number of developing countries*	*Number of basic production facilities*	*Number of processing/ production facilities*	*Number of production facilities with third parties*
Europe	5	—	5	21	46	67 (+3 Lic Ag)
Africa	10	2	12	1	31	42 (+2 Lic Ag)
Latin America	17	—	17	34	109	95 (+12 Lic Ag)
Asia/Oceania	19	3	22	48	91	101
	51	5	56	104	277	305

* Including 3rd Party production facilities

STAFF EMPLOYED

Table 3 shows the total number of staff employed by the twenty-two companies in the Developing Countries. The number of staff increased by 7 per cent compared to 1979-80. In both periods, less than one per cent of employees were expatriates. It is interesting that the total of 95,000 employees is almost fifty per cent more than the whole industry employs within Great Britain.

Table 4 gives a breakdown of these employees by types of activity. Almost half are employed in production and quality control, with 29 per cent employed in marketing and 16 per cent in administration.

TABLE 3 Staff Employed by Some Research-Based Pharmaceutical Industries
Established in Developing Countries: Members of the United Nations

Region	*Developing Countries*	
	Local Personnel	*Expatriates*
Africa	13,924	104
Asia/Oceania	40,620	265
Europe	10,465	100
Latin America	29,849	216
	94,858	685
Total	95,543	

TABLE 4 Staff Employed in Types of Activity—by Some Research-Based Pharmaceutical Industries
Established in Developing Countries: Members of the United Nations

Region	*Total numbers employed*	*Type of activity*				
		Production/ quality control	*Storage*	*Marketing*	*Admin.*	*Others*
Europe	10,565	4,262	456	3,513	1,605	729
Africa	14,028	10,964	288	1,502	1,018	256
Latin America	30,065	11,459	1,389	10,515	5,326	1,376
Asia/Oceania	40,885	19,820	721	11,742	7,028	1,574
Total	95,543	46,505	2,854	27,272	14.977	3,935
%	100	48.7	3.0	28.5	15.7	4.1

RESEARCH

Table 5 shows the total annual research expenditure in tropical medicine for the twenty-two companies in the years 1976/77, 1979/80 and 1982/82. In total, over the seven years from 1976/77 to 1982/83 the six companies* actively engaged in research into tropical diseases have spent, in direct costs, a sum of 194 million US dollars on research into tropical medicine.

If one assumes that overheads increased this figure by 25 per cent, it brings the total spend for the seven years to 242 million US dollars.

Table 5 also shows the breakdown for expenditure in 1982/83 between the major tropical diseases.

Since 1976/77 growth in total spending has amounted to 5 per cent per year, with malaria and filiariasis as the most important single disease areas.

Table 6 shows the medicines developed by the research based pharmaceutical companies primarily for use against tropical diseases.

Table 7 gives a list of medicines similarly developed, but with a secondary indication for tropical disease treatment.

---

* Bayer AG, CIBA-GEIGY, Hoechst AG, E Merck, Hoffmann-La Roche, Rhone Poulenc and the Wellcome Foundation Limited.

TABLE 5 Annual Research and Development Expenditure in Tropical Medicine

	1976/7	1979/80	1982/83
TOTAL ANNUAL EXPENDITURE $m	24.2	26.4	31.5
			1982/83
Malaria			8.1
Schistosomiasis			3.3
Filariasis			5.0
Trypanosomiasis			1.4
Leishmaniasis			0.7
Leprosy			0.1
Other tropical diseases			9.2
Not classified			3.7

TABLE 6 Drugs Developed by the Research-Based Pharmaceutical Industry
Products with Primary Indication for Tropical Diseases.

*YOL**	*Trade Marks*	*Approved Names*	*Indications*
1980	MALATAC	Chloroquin phosphate	Malaria
1979	PIG-BEL	Necrotising enterocolitis vaccine	Active immunisation against N.E.
1979	BILTRICIDE	Praziquantel	Schistosomiasis
1978	RADANIL	Benznidazole	Chagas' disease
1977	ENTAMIZOLE	Diloxanide Furoate Metronidazole	Amoebiasis
1977	PARAQUINE	Chloroquine phosphate Paracetamol	Malaria and associated fewer, pain
1976	FLAGENTYL	Secnidazole	Amoebicide, Trichomonacide
1974	ARILVAX (stabilised)	Leucosis-free yellow fever vaccine	Yellow Fever
1973	BILARCIL	Metriphonate	Schistosoma haematobium
1972	LAMPIT	Nifurtimox	Chagas disease
1972	FANSIDAR	Sulfadoxine & pyrimethamine	Malaria
early 1970s	JONIT	Bitoscanate	Hookworms (Ancylostoma duodenale & necator americanus)
1970	MALOPRIM	Pyrimethamine & Dapsone	Malaria
1969	LAMPRENE	Clofazimine	Leprosy
1968	ENTACYL	Piperazine	Roundworm & Threadworm
1967	DAMETIN	Dehydroemetine	Amoebiasis
1966	AMBILHAR	Niridazole	Bilharziasis, Amoebiasis, Dracunculosis
	ANTHEMAL	Sylfametopyrazine & pyrimethamine	Malaria
	FANTORIN	Stibophen	Schistosomiasis
1966-1980	Various Diagnostics for detection of schistosomiasis, amoebiasis, Chagas' disease, sleeping sickness, Kalar Azar.		Diagnostics

* Year of Launch

TABLE 7 Drugs Developed by the Research-Based Pharmaceutical Industry
Products with Secondary Indication for Tropical Diseases

*YOL**	*Trade Marks*	*Approved Names*	*Indications*
1983	MIRAXIN	Pivmecillinam & Pivampicillin	Typhoid fever
1981	AUGMENTIN	Amoxycillin & Clavulanic Acid	Typhoid fever, chancroid
1980	SELEXID	Pivmecillinam	Typhoid fever
1975	TIBERAL	Ornidazole	Trichomonacide
1973	ANTOCIL	5-fluorocytosine	Systemic antifungal agent
1969	DAVITAMON	Davitamon Tropical	Broad usage in internal medicine, gynaecology, ophthalmology, stomatology & odontology, dermatology
1969	BACITRIM/ SEPTRIN	Trimethoprim & Sulfamethoxazole	Typhoid & paratyphoid fever, bacillary dysentery cholera, acute brucellosis, mycetoma, system fungal infections
1968	RIMACTANE	Rifampicin	Leprosy, tuberculosis & bacterial infections
1968	KETRAX	Levamisole	Roundworm infestations
	AMOXIL	Amoxycillin	Typhoid fever
	FERRASTRAL	iron preparation	Anaemias
	DRONCIT	praziquantel	Schistosomiasis Helminthiasis

* Year of Launch

TRANSFER OF TECHNOLOGY

As in the 1979-80 survey, companies were asked to give brief details of examples of transfer of technology (TOT) to Developing Countries. The following questions were asked, and the replies relating to each example are set out on the following pages:

EXAMPLE OF TRANSFER OF TECHNOLOGY

PROJECT:
To design, train and run-in a formulation plant, Kuwait.

1. Who is organising or financing the project?	1,2 Organised/financed by Kuwait Pharmaceutical Industrial Company (IPICO) — Shareholding company under laws of Kuwait, owned by Kuwaiti Government (35%), ACDIMA (25%) and public shares (40%).
2. For whom is the project intended?	
3. Where is it being conducted?	3. In Kuwait.
4. What was the date of commencement?	4. Decision to build taken in 1980/81.
5. What was the date of completion?	5. Date of completion 1985/86.
6. What is the advantage to the developing countries?	6. Advantage to Kuwait: input of technology and G,P standards; training of personnel and start-up of plant.
7. What is the advantage, or even profit, to your own Company?	7. Advantage to company: market channel and contacts.

TRANSFER OF TECHNOLOGY

As in the 1979-80 survey, companies were asked to give brief details of examples of transfer of technology (TOT) to Developing Countries. The following questions were asked, and the replies relating to each example are set out on the following pages:

PROJECT:

To advise Federal Ministry of Health on upgrading of production facilities at Ministry's pharmaceutical production units in Nigeria.

1. Who is organising or financing the project?	1. Supported and initiated by foreign government.
2. For whom is the project intended?	2. Nigeria Ministry of Health.
3. Where is it being conducted?	3. Ministry's pharmaceutical production units at Yaba, Lagos, at Teaching Hospital, Benin City and Teaching Hospital, Zaris.
4. What was the date of commencement?	4. Survey and recommendations during 1982.
5. What was the date of completion?	5. Ongoing.
6. What is the advantage to the developing countries?	6. Advantages to Nigeria: improved production facilities for standard pharmaceuticals for local hospitals.
7. What is the advantage, or even profit, to your own Company?	7. Advantages to company: contacts with local health authorities and possible influence of general higher standard on pharmaceuticals in the country.

PROJECT:

Transfer of Technical know-how for the formulation of finished human and veterinary pharmaceuticals, Yugoslavia.

1.

2. Local workers co-operative pharmaceutical plants.

3. Yugoslavia.

4. Commenced 1977.

5. Co-operation continues and is being extended to include further items in healthcare.

6. Advantages to Yugoslavia: local production of essential pharmaceutical/veterinary products for use within the country and for export; saving of foreign exchange and export earning.

7. Some advantage from supply of raw materials.

PROJECT:

To set up a formulation plant in Nigeria

1. Administered by pharmaceutical company, financed by pharmaceutical company/Northern Nigeria Instruments Ltd and private shareholders

2. Intended for j/v — pharmaceutical company 40% holding.

3. In Kaduna.

4. Construction started — 1979.

5. Inaugurated — 1981.

6. Advantages to Nigeria: input of technology and of GMP standards; saving of foreign currency for drug import.

7. Advantages to company: market channel.

EMERGENCY AID AND OTHER TYPES OF AID SUPPLIED BY SOME OF THE RESEARCH-BASED PHARMACEUTICAL INDUSTRIES

Emergency and other types of aid received by developing countries centred on the following needs:

- Earthquakes
- Hurricanes/cyclones
- Famine catastrophes
- Flood disasters
- Disturbances resulting from political upheaval

Aid was provided in collaboration with a number of International and National Relief Organisations.

The following are examples of aid provided:-

- The supply of pharmaceutical specialities and general medical supplies, including vaccines, water purification tablets, analgesics, antibiotics, vitamins.

- Donations to various societies and institutes, e.g. International Relief Organisations for blind/disabled/child health.

- Establishing new community health clinic.

- Finance for pharmaceutical education and distribution of educational material.

- Finance for research, e.g. river blindness, cancer, effect of B.C.G. vaccine.

- Gas analyser: purchase of a respiratory measurement device for local clinic.

- Cash donations.

- Sponsorship of W.H.O. study on influence of a vitamin-mineral combination against development of cancer of the oesophagus.

- Donation of mobile van and related expenses.

- Assistance to W.H.O. essential drug programme.

Table 8 lists the countries benefitting from this emergency aid in 1981-82, and Table 9 lists the Third Parties involved in providing it.

TABLE 8 Countries Benefitting from Emergency Aid

Afghanistan	India	St. Lucia
Angola	Ivory Coast	Sri Lanka
Bangladesh	Jamaica	Somalia
Benin	Lebanon	Sudan
Brazil	Lesotho	S.W. Africa
Cambodia	Madagascar	Tanzania
Chad	Malaysia	Togo
Colombia	Mali	Thailand
Dominican Republic	Mexico	Uganda
El Salvador	Niger	Upper Volta
Eritrea	Nigeria	Vietnam
Ethiopia	Paraguay	Zaire
Gambia	Philippines	Zambia
Ghana	Rwanda	Zimbabwe
Guinea	Sierra Leone	

TABLE 9 THIRD PARTIES involved in emergency aid
National and International Organisations

W.H.O.
German Red Cross
TULIPE (transfert d'urgence de l'industrie pharmaceutique)
Lions Club, Compiegne
IFIP
Médicins du Monde
Action Internationale contre la Faim
Fondation Mondiale de Secours et d'Amitié
Ordre de Malte
AFRIDA
Ghana Supply Commission
Governmental Healthcare/Family Planning Programmes
Religious organisations, missionaries, hospitals, doctors healthcare workers
Ministry of Health

CONCLUSION

The pharmaceutical industry has sometimes been criticised for its indifference to the needs of the Third World, and for its abuse of the naïve situation existing in many Developing Countries.

This survey has illustrated the fact that the industry is making a very real positive contribution in the Third World. In addition, the International Federation of Pharmaceutical Manufacturers' Associations, based in Geneva, has been taking active steps to monitor the activities of pharmaceutical companies in the Third World, in order to ensure that their behaviour is responsible and constructive.

As a result, the multi-national research-based companies are now setting higher standards of ethical behaviour which should provide an example to the local indigenous manufacturers within the Developing Countries. But as it was pointed out in the introduction, the pharmaceutical manufacturers alone cannot solve the health care problems of the Third World. Nevertheless, they are making a positive contribution which should act as a stimulus to the local governments to tackle more positively the more fundamental health problems, such as poor sanitation and malnutrition.

Appendix I

THE 22 EUROPEAN RESEARCH-BASED PHARMACEUTICAL COMPANIES INCLUDED IN THE SURVEY ARE:

Astra
Bayer AG
Beecham Pharmaceuticals Ltd
C H Boehringer Sohn/Ingelheim
Boehringer Mannheim GmbH
Boots Company Ltd
Ciba-Geigy AG
Fisons PLC
Glaxo Holdings Ltd
Hoechst AG including Behringwerke
F Hoffmann-La Roche & Co AG
ICI Ltd
Knoll AG
Leo Pharmaceutical Products
E Merck
Organon International BV
Reckitt & Colman Products Ltd
Rhône-Poulenc Santé
Roussel Uclaf
Sandoz AG
Schering AG
The Wellcome Foundation Ltd

Appendix II

EXCHANGE RATES USED

Country	*Average 1981 & 1982 to £*
USA	1.89
France	11.13
Switzerland	3.72
West Germany	4.37
Sweden	10.61
Netherlands	4.83

Reference:
Worlock A. (1982) Pharmaceuticals in Developing Countries. Office of Health Economics.