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**THE ECONOMIC BURDEN OF A SUSTAINABLE EPI:
Implications for Donor Policy**

**Resources for
Child Health
Project**

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REACH



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**THE ECONOMIC BURDEN OF SUSTAINABLE EPI
IMPLICATIONS FOR DONOR POLICY**

by

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INTRODUCTION

The goal of universal coverage for the vaccine preventable diseases has been a motivating factor in the push for Expanded Programs of Immunization (EPI). Through a combination of country commitment and donor support, significant progress toward this goal has been made in the past few years. Immunization coverage in the developing world has risen from 10 to 50 percent during the decade of the 1980s, saving an estimated 1.5 million children every year. Nevertheless, considerable additional progress needs to be made before the goal of universal coverage is in sight for many countries.

Recognition of the need for additional resources for immunization has been reflected in high levels of donor support for EPI and the development of new relationships among both donors and countries. However, increasing attention is being focused on the "sustainability" of these efforts. While this term is often not consistently defined, the interest in sustainability reflects a general concern about the impact of donor support on strengthening the country's willingness and ability to generate the resources required for continuing immunization efforts and the achievement of immunization targets. For the United States Agency for International Development (USAID), sustainability has been defined as the likelihood that a country will continue to achieve and maintain immunization targets without further donor support. In this sense, sustainability relates only to the attributes and actions of the country and not those of the donor.

Sustainability reflects more than just the capacity of the country to generate the economic resources necessary to support a level of immunization sufficient to generate the desired outcome. Having the capacity to generate such results is not a sufficient condition for their achievement. Additionally, countries must have the commitment and political will to support and continue the immunization efforts. Donor efforts to support EPI have emphasized the development of such commitment as well as the direct provision of resources. Yet, without the capacity to provide resources, no amount of commitment will suffice. The ability of a country to bear the economic burden of EPI is a necessary condition for achieving sustainability as it is being defined.

For each country, the ability to bear the economic burden of immunization coverage depends on two factors; 1) what it costs to immunize the target population; and 2) the country's capacity to generate the economic resources necessary to meet those costs. Both of these factors need to be considered before an estimate of the potential for meeting and sustaining immunization targets can be made.

I. General Methodology

The goal of this policy analysis is to explore the potential for developing sustainable EPI. It does so by projecting the ability of a sample of 50 developing countries to bear the economic burden of support for EPI in the year 2000 and by considering the implications of the findings for designing and implementing donor strategies which will support sustainable EPI.

The analysis is based on a sample of developing countries in Africa, Asia, and Latin America. They were selected solely on the basis of available data, primarily from the World Bank and World Health Organization (WHO). They represent a wide range of economic conditions with per capita gross domestic product (GDP) ranging from a low of \$114 to a high of \$2,808. The sample included 14 child survival emphasis countries and some relatively high-income countries, such as Korea and Venezuela, which were included for comparative purposes. With the exception of the African region, countries with populations of less than one million were excluded because of lack of economic data. A list of the countries and their general economic characteristics are presented in Tables 1 to 3.

The analysis addresses four questions fundamental to an assessment of sustainability:

1. What would the EPI targets cost?
2. What will the countries be able to afford?
3. At what cost to the country would the EPI targets be affordable?
4. Will economic growth make the targets affordable?

The answers to these questions are based on four general types of information: specification of the EPI targets and projections of the size of the target population, the cost of immunization programs, and the general level of domestic resources available to each of the countries in the sample. The bases for projecting these data to the year 2000 are described below.

A. Specifying the EPI Targets

The goal of the EPI is to provide protection against the six vaccine-preventable diseases: measles, diphtheria, tuberculosis, tetanus, pertussis, and poliomyelitis. Success is often measured in terms of fully immunized children (FIC): children who have received the full course of vaccinations for all six diseases. It is this measure that is used to describe the targets and measure the outcomes for EPI in the present analysis.

While the use of FIC as a program outcome measure is widespread, its use leads to an underestimate of the actual benefits derived from immunization efforts as well as an overestimate of the costs of EPI. The measure ignores the benefits from partial immunization for a given disease as well as from immunization for fewer than all six of the target diseases. It also treats costs as if they were used only to produce FIC, thus treating an aggressive polio immunization campaign in an area with low measles coverage as not making any contribution to the overall outcomes of the EPI.

On the other hand, the use of FIC as a program measure recognizes that an effective EPI needs to manage its activities so as to minimize the "missed opportunities" for moving to full coverage for every child encountered by the system. By focusing on FIC, this management dimension of EPI is emphasized. Additionally, morbidity and mortality in the target populations for EPI are highly interactive among the six diseases. Full protection has the best overall relationship with reduced risk and, therefore, is a good reflector of the ultimate goal of EPI: the reduction of mortality and morbidity from the vaccine-preventable diseases.

For the countries in this sample, estimates of FIC were produced from WHO data on immunization coverage for each of the six diseases for children under one year. Because coverage rates of FIC are rarely reported, estimates were developed from the individual coverage data. Lowest coverage is typically found for either DPT3 or measles, those being the last immunizations in the series and, therefore, most likely to be left out. Estimates used here for coverage of FIC are the lower of DPT3 or measles since these data will generally reflect the upper limit for FIC in a given population.

For the countries in the study, 1987 coverage rates vary considerably. In each of the three regions, the highest coverage rates are over 75 percent. At the other extreme, seven of the 28 African countries had coverage rates below 20 percent with the lowest being three percent. In Asia, three of the 13 countries has less than 20 percent coverage with the lowest being six percent. Only one Latin American country fell into this category with a coverage rate of 16 percent.

The overall goal for EPI remains universal childhood immunization. However, for the analysis here, a rate of 80% coverage of the target population is used as the operational goal.

B. Size of the Target Population

The size of the target population is defined as the expected number of newborns in the year 2000. This number was derived by applying the crude birth rate to projections of total population for the year 2000. Total population was estimated by extending the World Bank population projections for 1995, using the same rates of

population growth estimated for the first half of the decade. Newborn population was estimated by applying the crude birth rate (CBR) for the year 1987 to the population projections for the year 2000 derived above. This estimate is used to denote the target population for the EPI and estimates of coverage are described in terms of the percentage of this group fully immunized.

It is recognized that this estimate may be somewhat high due to mortality within the cohort during the immunization year. The target of 80 percent coverage makes the analysis that follows less sensitive to the precision of this figure.

C. Costs of Immunization Programs

The costs of immunization used in this analysis were derived from a review carried out as part of the Immunization Sustainability Study (Brenzel, 1989). The review considered 28 studies that estimated costs for immunization programs. The studies utilized a wide range of methodologies for estimating costs, differed in the components of costs that were considered, and utilized a variety of measures of program outcomes. As part of this review, eight studies were identified which produced comparable data and which linked costs to coverage levels as defined for this analysis. These studies were used as the basis for the cost estimate used for projections.

The studies used had many methodological similarities and presented a wide range of estimates of cost per FIC. Overall estimates range from less than \$7.00 to almost \$23.00, with the difference being unrelated to the type of immunization strategy used (fixed site, mobile team, or campaign). The average cost per FIC, excluding technical assistance, was approximately \$13.00, with a standard deviation of almost \$5.00. When technical assistance was included, the average cost per FIC was approximately \$15.00.

For purposes of the analysis presented here, \$15.00 per FIC will be used as a starting point. Yet it needs to be emphasized that this number, while within the range generally cited, is based on a small and varied experience. Also, no basis exists for assessing the degree to which the identified costs reflect an efficient use of resources. Differences in costs may only reflect differences in efficiency. Conversely, similar costs may mask real differences in the efficiency of producing immunization services. As a result, all of the conclusions reached in this analysis are tested against other levels of costs to determine how differences in costs might impact on the results.

D. Resources Available to the Country

Resources available to the country are measured by GDP: the total value of a country's annual output of goods and services. As such, it is the measure of overall economic activity and the best indicator of the country's economic capacity. It does not consider, however, the distribution of that output among the population. For countries with extreme inequality of income distribution, the use of GDP or per capita GDP as an indicator of affordability may not provide much insight into the likelihood of sustained EPI. As an overall measure, however, it provides a basis for generally differentiating available resources among the countries in the sample.

GDP for the year 2000 was estimated in two stages using the actual GDP for 1987 as the base. Per capita GDP was first estimated using growth rates developed by the World Bank for classes of countries for 1990 and 1995 (World Development Report 1987). Estimates of per capita GDP for the year 2000 were produced by simple projections of the World Bank growth rates. Two sets of rates for the growth of per capita GDP were projected, a "base" rate and a "high" rate. To test the potential of economic growth to contribute to the sustainability of EPI, an additional set of GDP estimates were derived for this analysis based on the "generous" assumption that the country's per capita GDP growth rate would be two percent higher than the high World Bank estimate.

These three estimates provide a wide range of potential growth. For the countries in Sub-Saharan Africa, the base rate assumes zero per capita growth in GDP. (This means that the growth in total GDP will be matched by the projected growth of population.) The high rate is projected at 0.7 percent. The generous estimate of 2.5 percent is, therefore, more than three times as high as the World Bank's high estimate for the region.

The estimates of total GDP were obtained by multiplying the projected per capita GDP by the population projections described earlier. This produces, for each country, three different possible levels of GDP, each reflecting a different set of assumptions about the performance of its economy over the next decade (e.g., expected rate of economic growth). These represent the total economic capacity of the countries against which both the costs and the affordability of EPI will be measured.

II. Results of the Analysis

A. What Would the EPI Targets Cost?

The overall costs of the EPI are estimated at \$15.00 per child in the year 2000 target population. For the analysis, these costs are expressed in terms of the percent of projected GDP for the year 2000 which would be required to support this level of coverage. These data are presented in Charts 1 to 3 with each chart being based on a different set of assumptions about the rates of economic growth.

Using the base growth projections, 22 of the 50 countries would be able to achieve 80 percent coverage using no more than 0.1 percent of GDP. For the two higher projections, that figure rises to 25 and 28 countries. For the base growth projections, 14 countries would need at least 0.2 percent of GDP with three countries needing at least twice that level. Even assuming a rate of growth for per capita GDP two percent higher than the high World Bank projections, seven countries would need at least 0.2 percent of GDP. In terms of share of GDP required, the countries in the sample face widely different costs for achieving the same coverage goal.

B. What Will the Countries be Able to Afford?

What a country can afford will depend on many factors in addition to the aggregate amount of resources available. Internal priorities, the demographic makeup of the population, and pressures for public (and private) expenditure in other areas will all influence the affordability of a given level of expenditure. Nevertheless, it is useful to explore the degree to which EPI targets could be achieved if each country committed the same share of GDP to finance EPI.

Charts 4 to 6 present the percentage of the target population that could be immunized with 0.1 percent of GDP under each of the assumptions about economic growth. Under the base growth assumptions, the commitment of 0.1% of GDP will leave over 32 million children not fully immunized, while with the high growth assumptions over 25 million children would fall into that category. Even for the most optimistic growth assumptions, almost 15 million children would remain not fully protected.

The implications of this level of commitment can be assessed by comparison with current total expenditures on health. Data on health expenditures as a percent of GDP were available for 31 of the countries in the sample. Of this group, 16 spent 1.0 percent or less on all health expenditures while only four countries spent more than 2.0 percent. For the first group, 0.1 percent would equal at least 10 percent of current health expenditures for EPI alone. For the latter group, this would represent less than 5.0 percent.

By almost any measure, 0.1 percent of GDP would represent a significant level of domestic commitment to EPI for most countries. However, even under the most optimistic growth assumptions, this level of resource commitment would not be sufficient to achieve 50 percent coverage in 12 of the countries studied. Under the World Bank high growth assumptions, half of the 50 countries would not reach the 80 percent coverage level. Using the base growth estimates, 12 of the countries could not afford to immunize more than one-third of the target population in the year 2000.

For the African countries in the sample, the limit of 0.1% of GDP would leave almost 14 million children not fully immunized under the base growth scenario and almost 12 million under the high growth scenario. For the Asian sample, the comparable figures are over 18 million and 13 million respectively. This means that over the entire sample, using the base growth scenario, a commitment from every country of 0.1% of GDP will leave almost 32 million children unprotected. Even under the high growth assumptions, over 25 million children fall into this category.

Both of the above analyses demonstrate the wide range of economic capacity relative to the EPI costs and targets that characterizes this group of developing countries. What is important to note is that even under the most optimistic (and unrealistic) assumptions about economic growth, meeting an 80 percent coverage target is well beyond the economic capacities of many countries. Under the more likely scenarios, many countries would be hard pressed even to allocate the amounts of resources required to maintain existing coverage levels without external resources.

C. At What Cost Would the EPI Targets be Affordable?

The ability to achieve and sustain EPI targets reflects both the countries' economic capabilities and the costs of immunization. Given the economic capacity examined above, it is useful to assess how changes in costs might impact on the capacity to meet EPI goals. This part of the analysis addresses that issue by estimating the highest cost per FIC at which 0.1 percent of GDP would be sufficient to support 80 percent coverage of the target population. The analysis demonstrates the value of cost-reducing donor strategies and also provides a measure of the sensitivity of the general results to the \$15.00 per FIC cost used in the earlier analyses.

The estimates are presented in Charts 7 to 9. Under the most optimistic economic growth projections, 13 countries would not be able to meet this goal at a cost of \$10.00 per FIC and six countries would still fall short at \$7.00 per FIC. Of the countries with higher per capita GDP, 22 countries could achieve 80 percent coverage at the cost of \$15.00 under the base growth assumptions; for 18, a one-third increase to \$20.00 would still leave the goal achievable.

D. Will Economic Growth Make the Targets Affordable?

As a last analysis, it is useful to ask what countries could expect to achieve without external resources if they make the level of resource commitment discussed above and the target population increases at the same rate as the total population. (This underestimates the growth in the target population somewhat and thus the number of years required to immunize 80 percent of newborns.) This analysis provides a sense of how far countries can get solely on their own commitment and political will, given their economic realities. It also provides a sense of the potential impact of population policies on the sustainability of EPI.

Charts 10 to 12 present estimates of how long it would take the 50 countries in the study to generate sufficient resources to cover 80 percent of the target population at \$15.00 per FIC assuming the most favorable rates of economic growth and an ongoing commitment of 0.1 percent of GDP earmarked for EPI. For the Latin American and many of the Asian countries in the sample, the goal of 80 percent coverage by the year 2000 is currently achievable, even within less optimistic projections of economic growth. The goal for many of the African countries, even under these favorable conditions, is over a quarter of a century away. For some, the time frame covers more than two generations.

Under more realistic expectations for economic growth, the goal would be even more difficult to achieve. Assuming the base growth rate, only 27 of the countries in the study could ever reach the goal. The result is only slightly better for the high growth projections where 13 of the countries would require more than 100 years to achieve 80 percent coverage with an additional nine requiring more than 40 years.

The general conclusions of the above analysis are quite insensitive to a wide range of changes in the basic assumptions used. While increases in economic growth, reductions in the cost of immunization, and reductions in the size of the target population all improve the economic capacity of countries to support EPI, for many countries no combination of these factors sufficient to permit the achievement of EPI coverage targets is likely to occur within the foreseeable future. The next section presents the implications of these conclusions for donor policies in support of sustainable EPI.

III. Implications for Donor Policy

The goal of universal coverage remains a driving force in the development of the EPI. At the same time, the growing focus on sustainability of EPI calls into question the reality of these goals in the economic context of much of the developing world. The above analysis provides a basis for exploring strategies which raise the potential of donor efforts to achieve the reductions in child mortality and morbidity which effective EPI can produce.

A. Sustainability as a Goal

All development policy strives to create the conditions for sustainability. Economic and social development initiatives are designed to support and strengthen the ability of countries to achieve and maintain an adequate standard of living, relying primarily on their own resources. As a focus for donor development programs, sustainability serves to emphasize this essential ultimate aim. It is recognized, however, that the time and external resources needed to achieve this end must be assessed in the unique context of each country. In the overall development context, progress toward sustainability is an ongoing measure of success. Its achievement will typically require commitments beyond the time frame of specific donor activities and programs.

Within the context of individual programs, such as EPI, the implications of sustainability as a goal require some further elaboration. As with all development strategies, an ultimate goal is to achieve national economic independence in the accomplishment of program objectives. For EPI, the ultimate goal is to create a capacity for and commitment to EPI as demonstrated by protection from the vaccine-preventable diseases. The challenge lies in the translation of that ultimate goal into an operational dimension of ongoing program efforts.

In addition to providing resources for the initiation and expansion of immunization programs, donors contribute to the goal of sustainable EPI by supporting development of the capacity to manage immunization efforts and by working collaboratively with countries to raise the relative priority given to immunization efforts. Each of these lines of donor activity can modify the degree to which progress toward sustainable EPI is limited by progress toward sustainable development for the country as a whole. Yet, the analysis demonstrates the degree to which progress in both areas is complementary. For many countries, achievement of the independent capacity for sustained EPI remains closely linked to the level of general economic development.

The establishment of an expectation of sustainability at the end of a fixed program period as a condition of donor support will have one of two results:

1. Donors will need to direct programs away from those countries most in need of external aid since many will have no likelihood of being able to meet the sustainability target.
2. Donors will have to establish lower coverage targets for programs based on a more realistic assessment of the level of effort which is feasible to be sustained for each country.

Each of these responses represents a retreat from the goal of protection for the vaccine-preventable diseases which falls most heavily on the poorest countries who are most in need of donor support.

Progress toward sustainability is an attribute of EPI which merits constant assessment. Yet, treating sustainability, defined as donor-independence, as an absolute condition to be achieved by the end of a specified program period will be counter-productive. Analysis demonstrates the wide divergence that exists among countries in terms of the present and projected ability to support, without external resources, the economic burden of EPI. The achievement of sustainable EPI in the near term is, therefore, for many countries, an unrealistic expectation.

Sustainability is a dynamic aspect of the development process, not a static attribute of programs or projects. What is needed, therefore, is a different concept of sustainability; one which reflects the general concern noted above about the impact of donor support on strengthening the countries' willingness and ability to generate the resources required for continuing immunization efforts and achievement of immunization targets. It should create incentives for developing the commitment and political will which recognize the economic realities in each setting. Rather than steering donors away from the settings in which external support is critical, the emphasis on sustainability should provide a basis for country-donor partnerships which enhance progress toward sustainable EPI.

B. Enhancing the Potential for Sustainable EPI

Effective donor policies in support of sustainable EPI need to incorporate two distinct dimensions: 1) the implementation of general initiatives to reduce the economic burden of EPI; and 2) the development of country-specific partnerships based on shared goals and commitments which incorporate a realistic path toward sustainability.

1. Reducing the Economic Burden

Reducing the economic burden of EPI involves both expanding the resource base and reducing the costs. Expanding the resource base needs to incorporate an overall sense of the country's economic capacity and its priorities. At a general level, donors need to recognize the link between EPI goals and other economic development activities and utilize opportunities to integrate these processes. In particular, general development agencies, such as AID, should consider linking EPI and other child survival initiatives with their own support for development in other sectors. Opportunities for linking EPI commitments to economic development initiatives of other agencies or multi-national agencies, such as the World Bank, also need to be explored. All donors, however limited their operating focus, should support efforts to strengthen the overall economic base of the settings within which they work.

An increased country commitment to EPI may depend on efforts to strengthen generally the resource base for health activities. Frequently, the resources for increasing the allocation of financial and human resources to immunization activities come out of the very limited share of national resources devoted to health activities. Opportunities also exist to support sustainable EPI (and child survival efforts) by linking commitment to these programs to broader health care financing initiatives. Efforts at resource mobilization often build upon the ability of curative services to generate additional resources through user fees and establishment of public or private insurance programs. Incorporating a commitment to preventive and promotive care into such health care financing initiatives presents a special challenge to donors committed to these ends. However, limiting the focus for strengthening the resource base for EPI to the resources already in the sector holds little promise for achieving sustainability in most settings.

Donor initiatives to enhance the resource base for EPI need to be matched with continued efforts to reduce cost to countries. Development of more cost-effective vaccines and immunization schedules is essential. Additionally, the development of new vectors and antigens for expanding the impact of EPI needs to continue. However, the sensitivity of the analysis to costs suggests that new vaccine formulations need to be evaluated critically for their overall cost-effectiveness, including an assessment of their impact on sustainability prior to widespread donor adoption.

Overall, the costs of vaccines are only a small proportion of the overall costs of EPI. Improved management of EPI through the design and implementation of more effective and efficient means for distributing vaccines, managing the cold chain, and reducing missed opportunities is an essential focus of strategies to reduce the costs of EPI. Donor support of technical assistance and training to improve the management of EPI is an important part of this process.

Strengthening the economic base and reducing the costs address only two of the three factors influencing the economic burden of EPI. While not within the scope of the immunization initiatives, policies that influence the size of the target population will have considerable impact on the sustainability of EPI. Donors need to support the efforts of countries to implement population policies which enhance the capacity for economic development and to recognize that the success of population/family planning policies may be critical for meeting EPI goals.

2. Developing Country-Donor Partnerships

The analysis also suggests a basis for developing country-donor partnerships which create incentives for developing the commitment and political will essential to the sustainability goal while recognizing the economic realities in each setting. The emphasis on partnership reflects the view that the goal of protection for vaccine-preventable diseases is a shared one which requires collaborative initiatives for its achievement. Additionally, these initiatives imply a continuous rather than episodic or ad hoc relationship between the country and the donor(s) which reflects realistic expectations with respect to the commitment of both partners.

While the goals are shared, each of the partners brings a different capacity and seeks a different assurance. Donors need to be satisfied that external resources are supporting the development of national commitment to EPI goals, not substituting for it. Countries need to be assured that the resources will remain long enough to justify the political will and permit a balanced program development that can resist the temptation to buy the "hardware" while the funding is available.

While the actual terms of such a partnership need to be developed for each situation, in general, the country commitment will be specified in terms of a systematic share of available national resources. This means that the EPI will share in all economic growth, regardless of its source, and, conversely, that national resources for EPI may be reduced in proportion to the fall in overall resources without compromising the integrity of the partnership. In this manner, the country accepts a constant economic burden, large enough to be evidence of commitment yet not unachievable within country resources. As the country develops, an increasing share of the costs of EPI will be borne by the country, thus demonstrating the progress toward sustainability which is central to the development process.

For their part, donors will have to commit to provide, on a continuing basis, the difference between country resources and resources sufficient to meet the agreed upon target coverage levels. This means that the donors obligations, in financial terms, will vary in relationship to the economic capacity of the country partner. Of

critical importance, as well, is that donors' commitments cannot be time limited. Rather, they must be based on an open-ended commitment to provide necessary resources as long as the country partner continues to demonstrate commitment and political will by providing a fixed and substantial share of national economic resources to the program.

While such a time-unlimited commitment might seem difficult for a single donor, in fact, most major donors have demonstrated a real commitment to the goals of EPI independent of how long it might take as well as a willingness to expand those goals by the addition of new vaccines which target different sources of mortality and morbidity. Goal-oriented, rather than time-oriented, commitments might require new donor relationships as well as new country-donor partnerships. Pooled funding, endowment strategies, and other innovative funding mechanisms might need to be developed to implement the strategy effectively, but such developments are not beyond the capabilities of a motivated donor community.

The potential for developing such partnerships is a real one. While the economic burden of EPI is high for many individual countries, the economic burden to the world of filling the coverage gap is relatively small. The total amount of resources required to meet the 80 percent coverage target in the year 2000 for all of the countries in the sample was approximately \$1.5 billion, far less than 0.3 percent of total health expenditures in the United States in 1988. In this sense, the sustainability of EPI is well within our collective capacity.

Limiting the sustainability focus to the capacity of individual countries is counter-productive. By focusing on the collaborative contributions to EPI goals, the emphasis on sustainability can enhance our ability to develop and support the commitment and political will on which the achievements of EPI depend.

TABLES AND CHARTS

TABLE 1:
ECONOMIC CHARACTERISTICS AND IMMUNIZATION COVERAGE OF STUDY COUNTRIES
LATIN AMERICA

COUNTRY	GDP/CAP 1986	GOV EXP % GDP 1986	HEALTH EXP % GOV'T EXP 1987	HEALTH EXP AS % OF GDP 1987	IMMUN. COV. (LOWER OF DPT3 OR MEASLES) 1987
Argentina	\$2,252	26.9%	1.3%	0.3%	75%
Bolivia	\$633	30.3%	1.4%	0.4%	24%
Brazil	\$1,494	32.0%	6.4%	2.0%	55%
Costa Rica	\$1,638	26.5%	19.3%	5.1%	43%
Ecuador	\$1,199	24.4%	7.3%	1.8%	46%
El Salvador	\$812	13.0%	7.5%	1.0%	48%
Mexico	\$1,585	34.0%	1.4%	0.5%	54%
Venezuela	\$2,808	27.7%	8.1%	2.2%	54%
Guatemala	\$911				16%

Blank indicates data not available.

TABLE 2:
ECONOMIC CHARACTERISTICS AND IMMUNIZATION COVERAGE OF STUDY COUNTRIES
ASIA

COUNTRY	GDP/CAP 1986	GOV EXP % GDP 1986	HEALTH EXP % GOV'T EXP 1987	HEALTH EXP AS % OF GDP 1987	IMMUN. COV. (LOWER OF DPT3 OR MEASLES) 1987
Bangladesh	\$150	11.6%	5.3%	0.6%	6%
Bhutan	\$162				23%
Burma	\$215	15.1%	8.4%	1.3%	14%
India	\$261	18.2%	2.1%	0.4%	17%
Indonesia	\$452	29.2%	1.9%	0.6%	46%
Nepal	\$129	22.8%	5.0%	1.1%	40%
Sri Lanka	\$365	33.4%	4.0%	1.3%	47%
Thailand	\$794	22.1%	5.7%	1.3%	34%
China	\$258				75%
Malaysia	\$1,713	39.1%			59%
Philippines	\$533	11.3%	6.0%	0.7%	73%
Republic of Korea	\$2,365	17.8%	1.5%	0.3%	76%
Turkey	\$1,022	23.7%	2.2%	0.5%	50%

Blank indicates data not available.

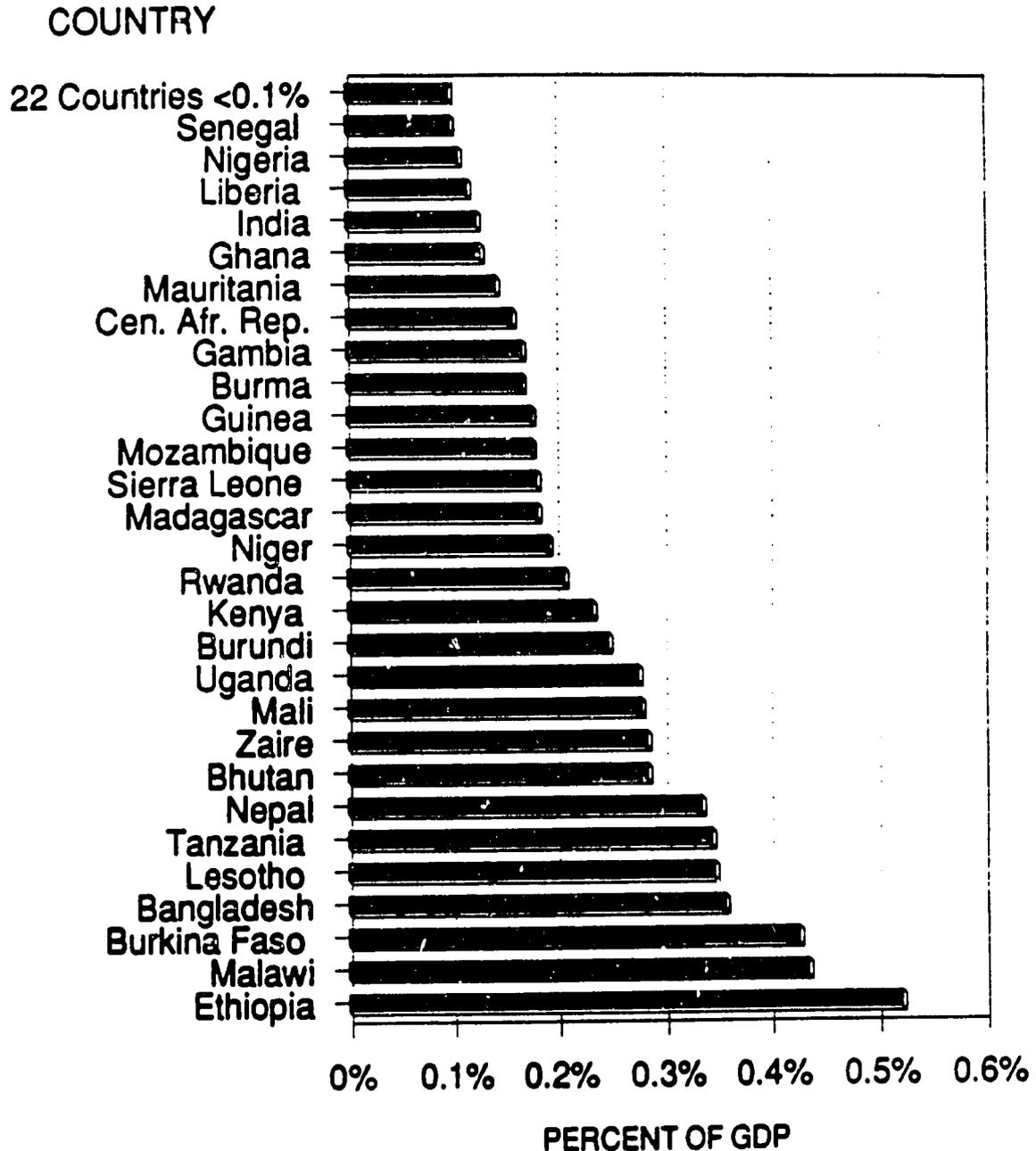
TABLE 3:
ECONOMIC CHARACTERISTICS AND IMMUNIZATION COVERAGE OF STUDY COUNTRIES
AFRICA

COUNTRY	GDP/CAP 1986	GOV EXP % GDP 1986	HEALTH EXP % GOV'T EXP 1987	HEALTH EXP AS % OF GDP 1987	IMMUN. COV. (LOWER OF DPT3 OR MEASLES) 1987
Burkina Faso	\$134	14.8%	6.2%	0.9%	34%
Burundi	\$227				58%
Cameroon	\$1,074	19.0%	5.1%	1.0%	39%
Cen. Afr. Rep.	\$333				24%
Congo	\$1,089				69%
Cote d'Ivoire	\$699	32.6%	4.0%	1.3%	71%
Ethiopia	\$114				10%
Gambia	\$342				77%
Ghana	\$433	12.6%	8.3%	1.0%	37%
Guinea	\$314				15%
Kenya	\$281	29.7%	6.4%	1.9%	60%
Lesotho	\$144	62.3%	6.9%	4.3%	77%
Liberia	\$432	28.8%	5.7%	1.6%	13%
Madagascar	\$252				10%
Malawi	\$146	34.4%	6.9%	2.4%	53%
Mali	\$217	28.2%	1.7%	0.5%	3%
Mauritania	\$417				32%
Mozambique	\$303				29%
Niger	\$315				5%
Nigeria	\$482	20.8%	7.7%	1.6%	16%
Rwanda	\$298				67%
Senegal	\$550				53%
Sierra Leone	\$311	13.6%	5.8%	0.8%	30%
Swaziland	\$1,001				74%
Tanzania	\$175	34.2%	4.9%	1.7%	69%
Uganda	\$218	9.9%	2.4%	0.2%	39%
Zaire	\$190				32%
Zimbabwe	\$568				77%

Blank indicates data not available.

Chart 1

TOTAL EPI COST AS % OF GDP 80% COVERAGE BASE GROWTH SCENARIO - YEAR 2000*

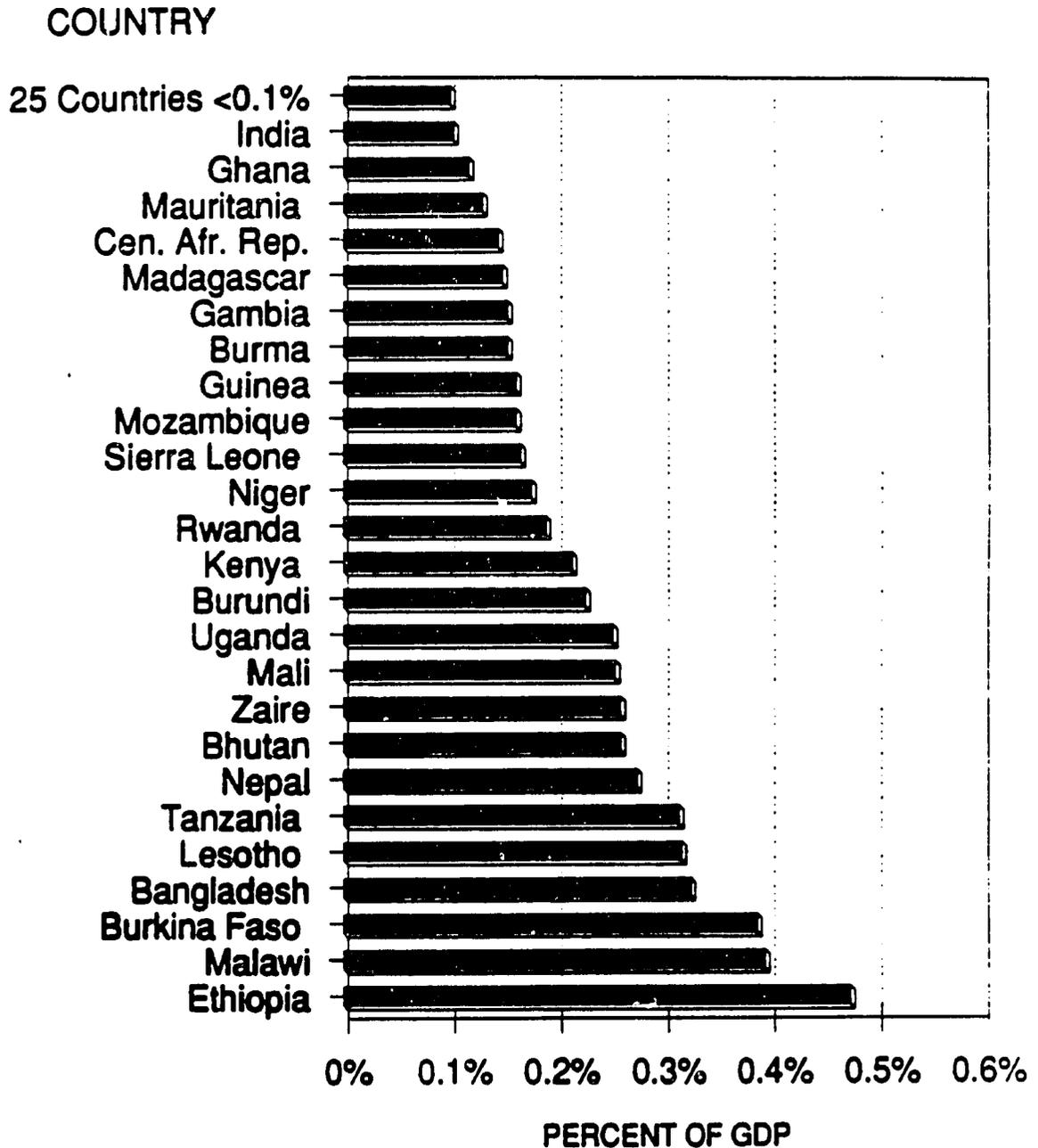


* EPI expenditure at 0.1% of GDP;
Cost per FIC = \$15

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Chart 2

TOTAL EPI COST AS % OF GDP 80% COVERAGE HIGH GROWTH SCENARIO - YEAR 2000*

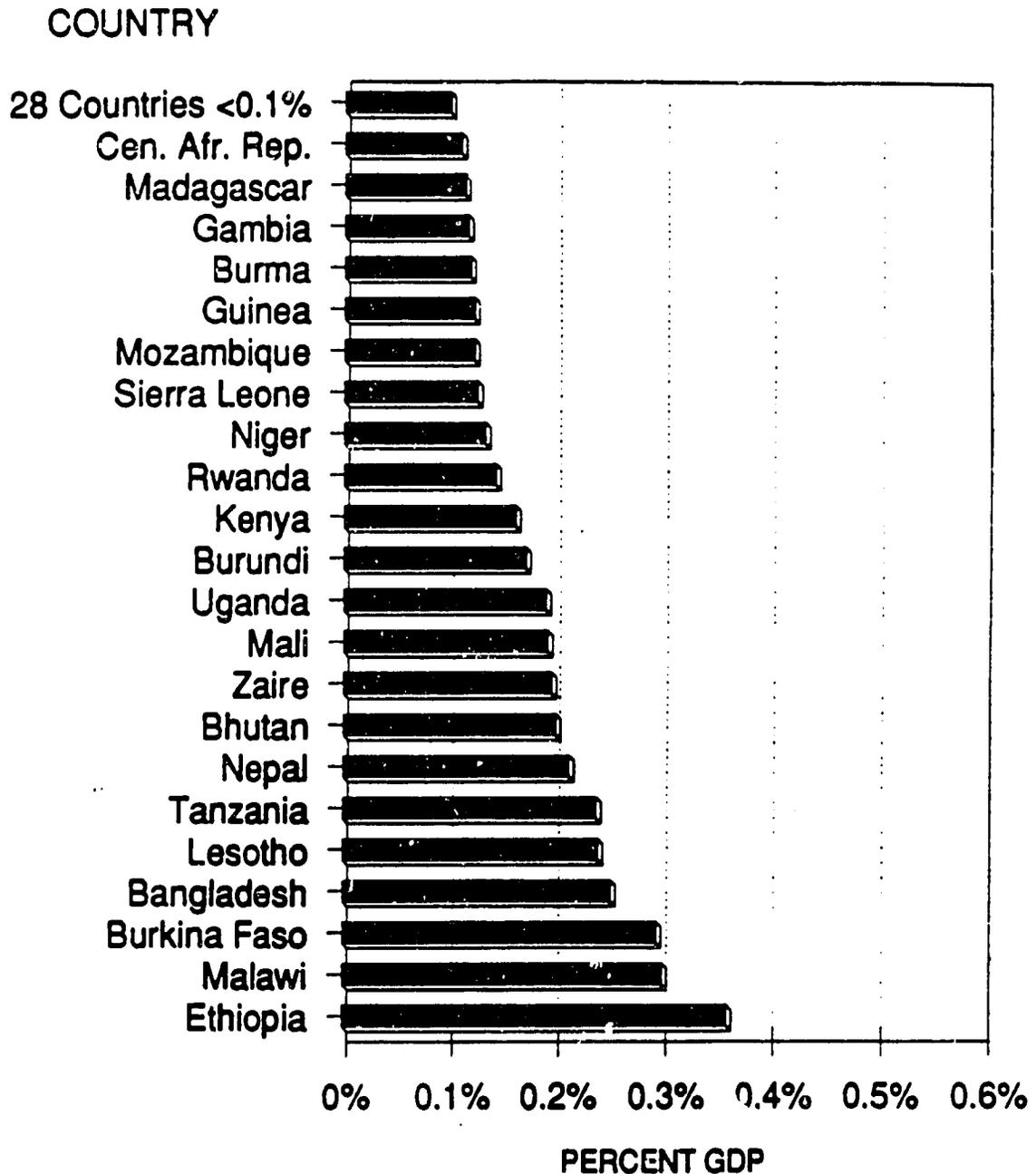


* EPI expenditure at 0.1% of GDP;
Cost per FIC = \$15

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Chart 3

TOTAL EPI COST AS % OF GDP 80% COVERAGE HIGH GROWTH + 2% SCENARIO - YEAR 2000*

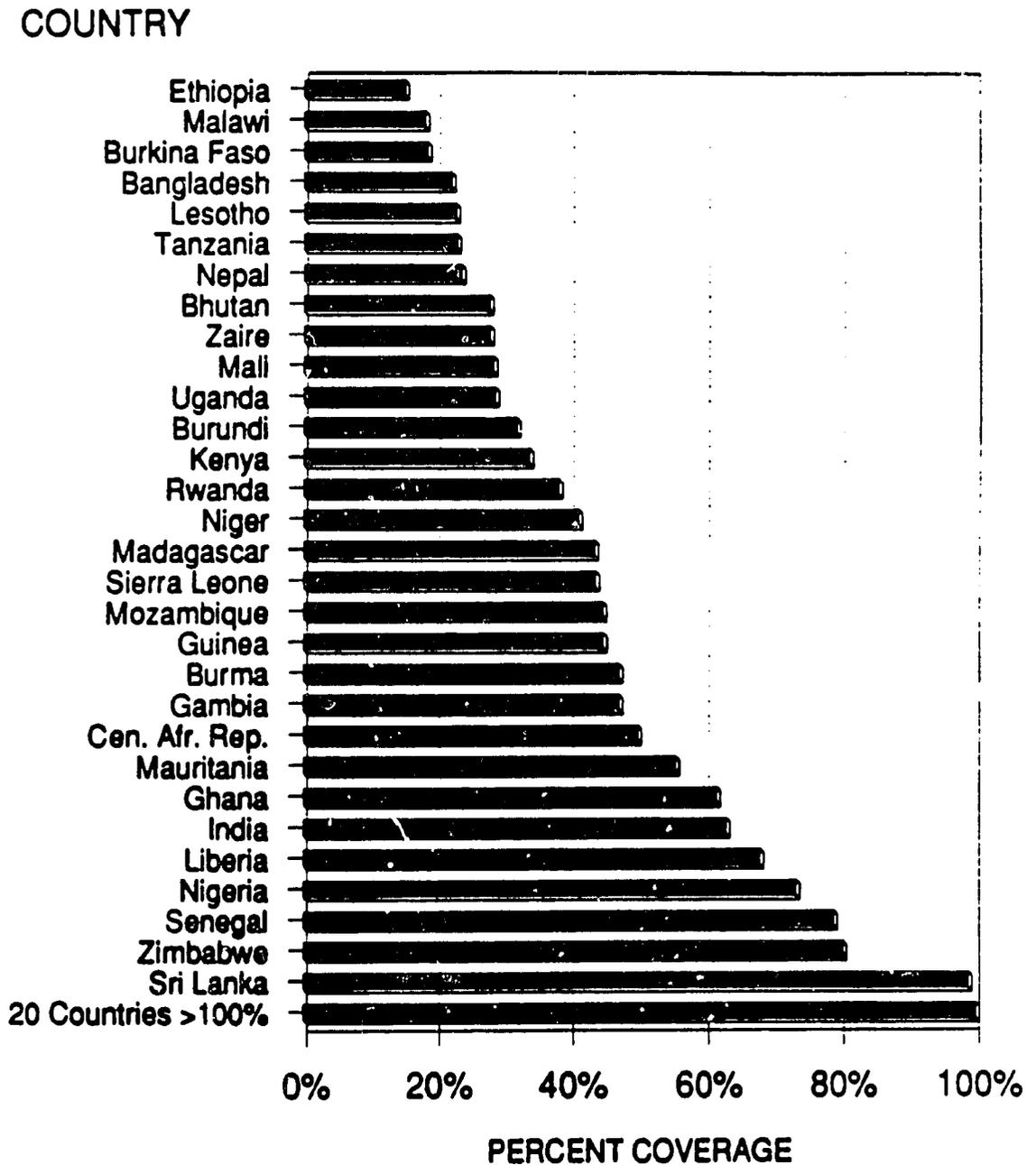


* EPI expenditure of 0.1% of GDP;
Cost per FIC = \$15

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Chart 4

IMMUNIZATION COVERAGE ACHIEVABLE WITH EPI EXPENDITURES OF 0.1% OF GDP BASE GROWTH SCENARIO -YEAR 2000*

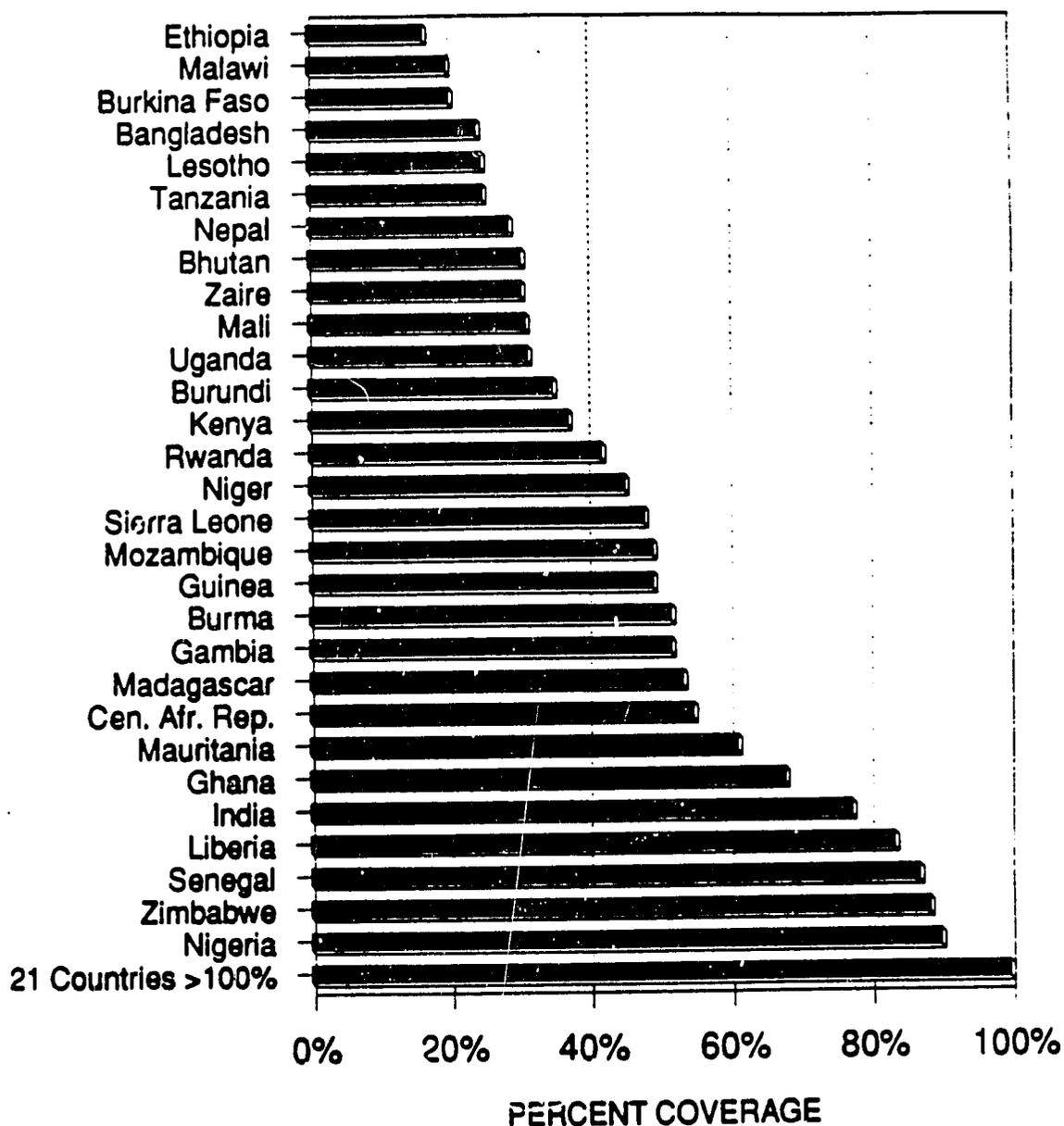


* Cost per FIC = \$15

Chart 5

IMMUNIZATION COVERAGE ACHIEVABLE WITH EPI EXPENDITURES OF 0.1% OF GDP HIGH GROWTH SCENARIO - YEAR 2000*

COUNTRY



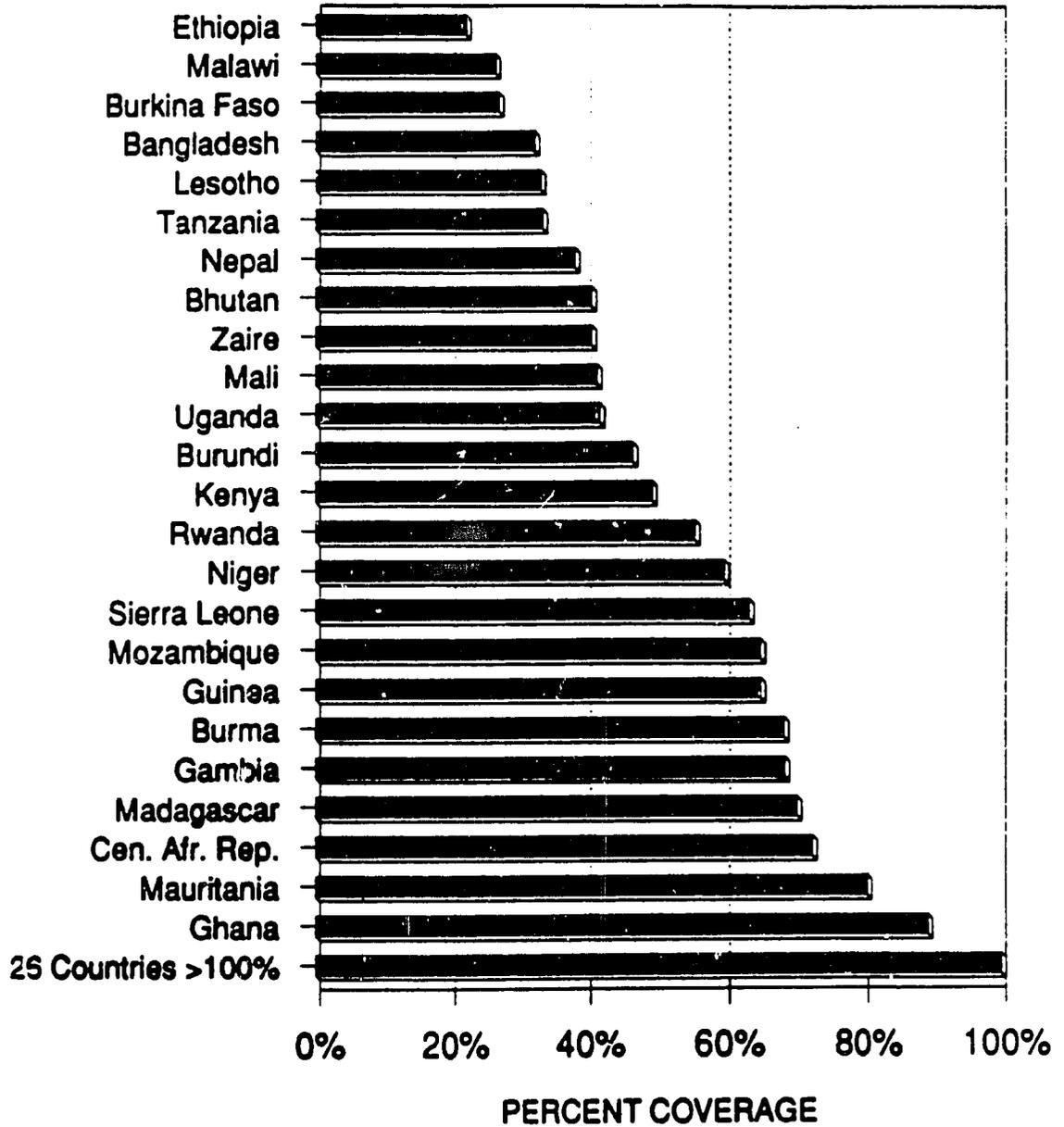
* Cost per FIC = \$15

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Chart 6

IMMUNIZATION COVERAGE ACHIEVABLE WITH EPI EXPENDITURES OF 0.1% GDP HIGH GROWTH + 2% SCENARIO - YEAR 2000*

COUNTRY



*Cost per FIC = \$15

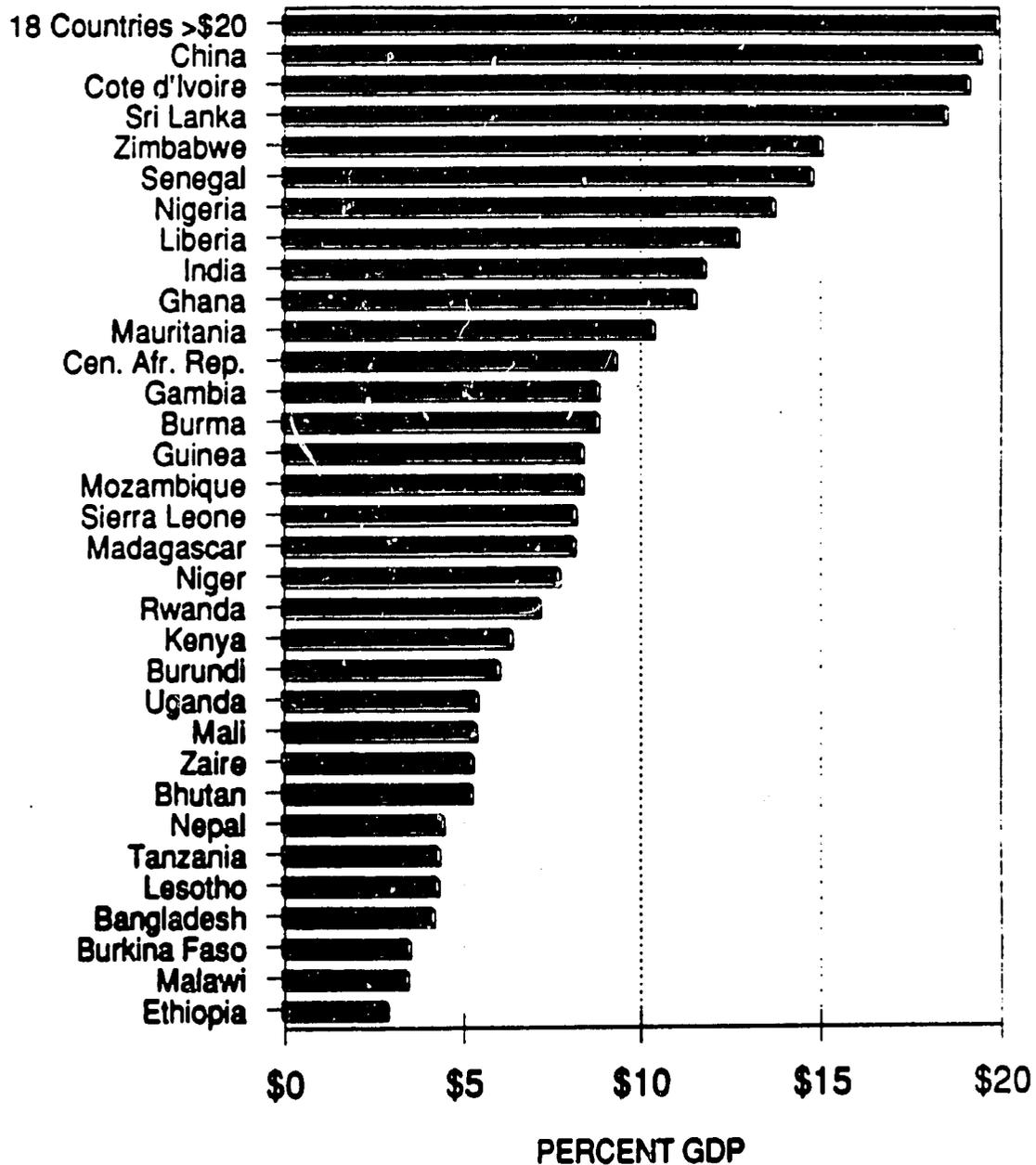
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Chart 7

FEASIBLE AVERAGE EXPENDITURE PER FIC - 80% COVERAGE BASE GROWTH SCENARIO - YEAR 2000*

COUNTRY



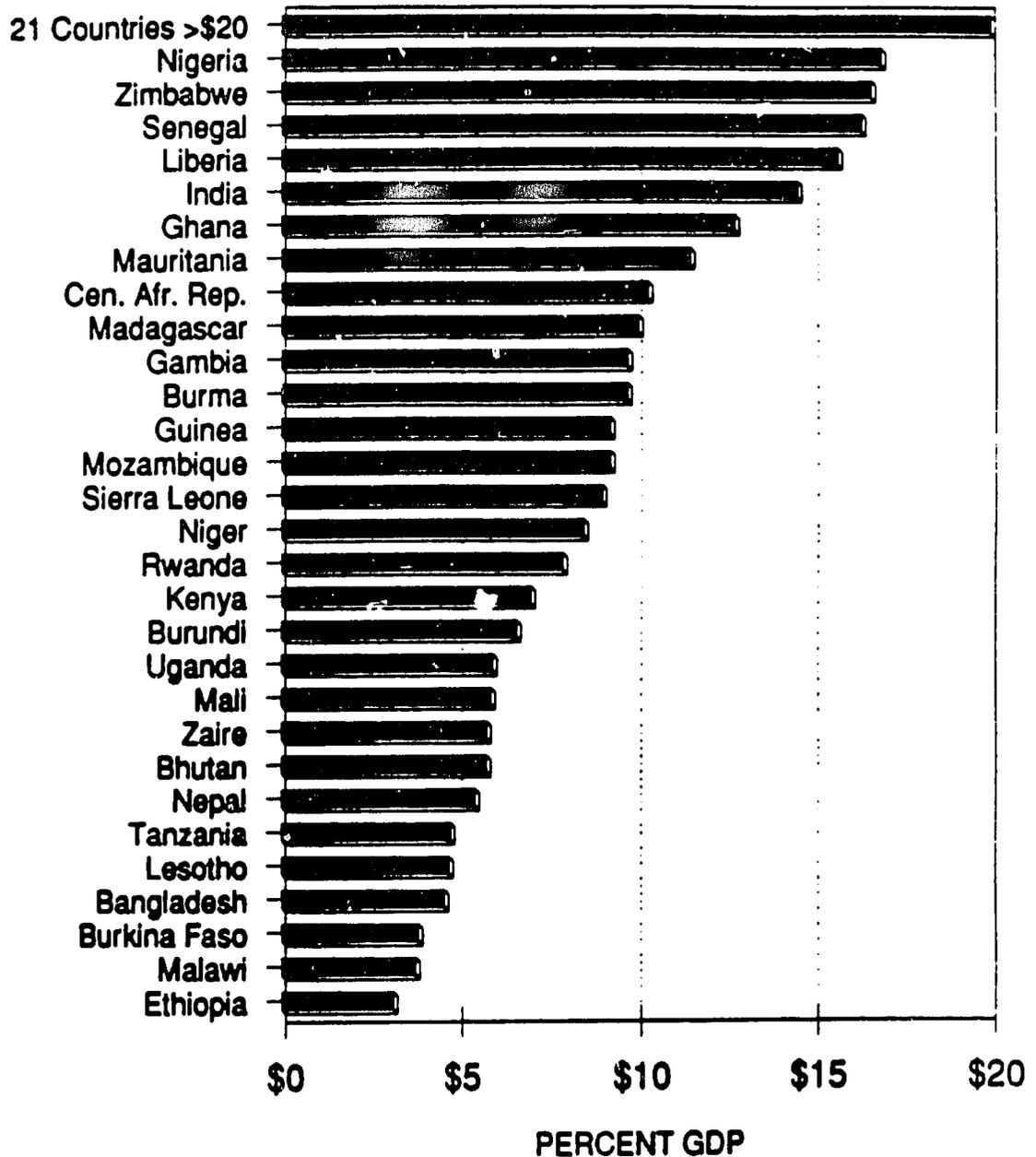
* EPI Expenditure of 0.1% of GDP

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Chart 8

FEASIBLE AVERAGE EXPENDITURE PER FIC - 80 % COVERAGE HIGH GROWTH SCENARIO - YEAR 2000*

COUNTRY

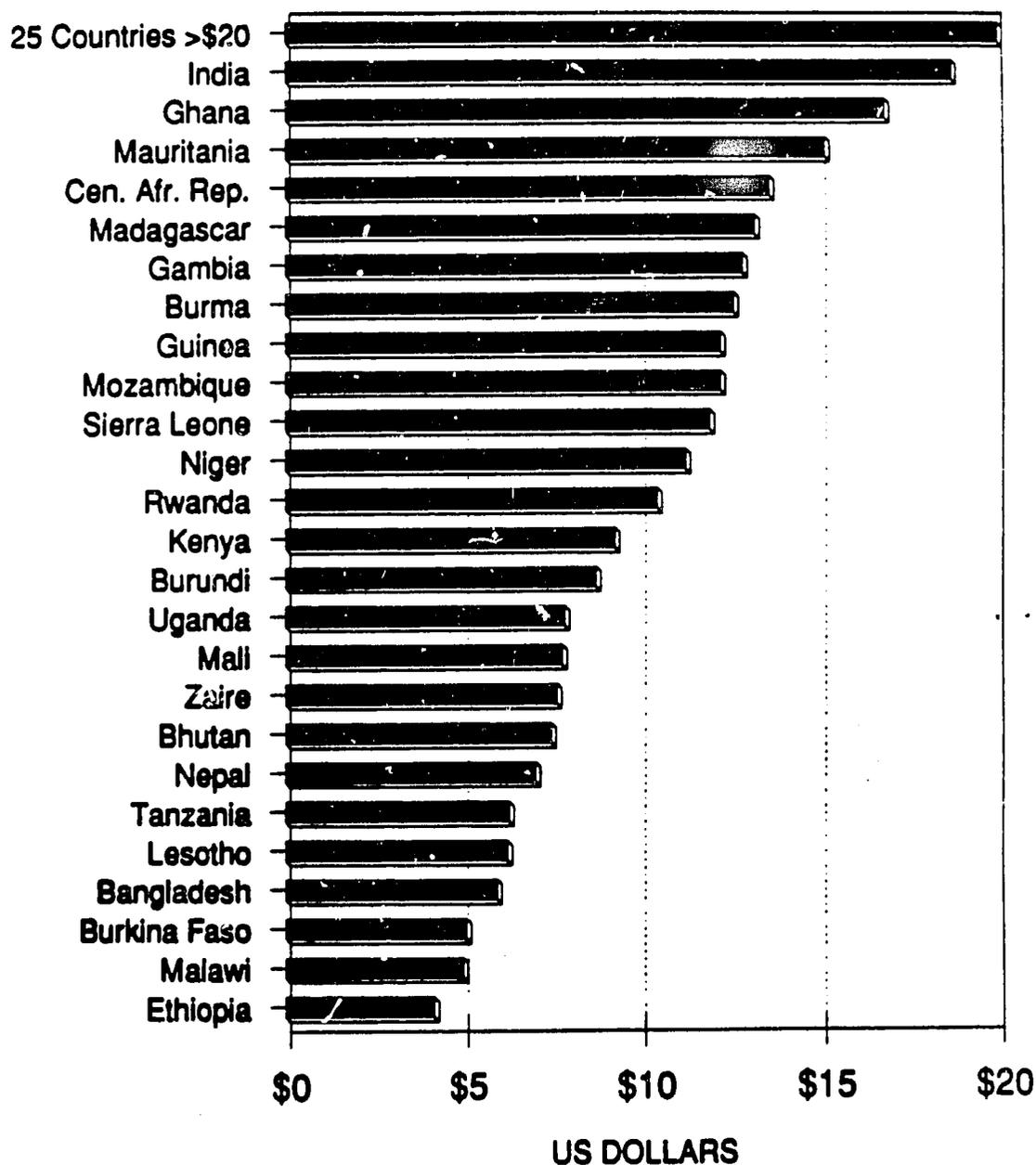


* EPI expenditure of 0.1% of GDP

Chart 9

FEASIBLE AVERAGE EXPENDITURE PER FIC - 80% COVERAGE HIGH GROWTH +2% SCENARIO - YEAR 2000*

COUNTRY



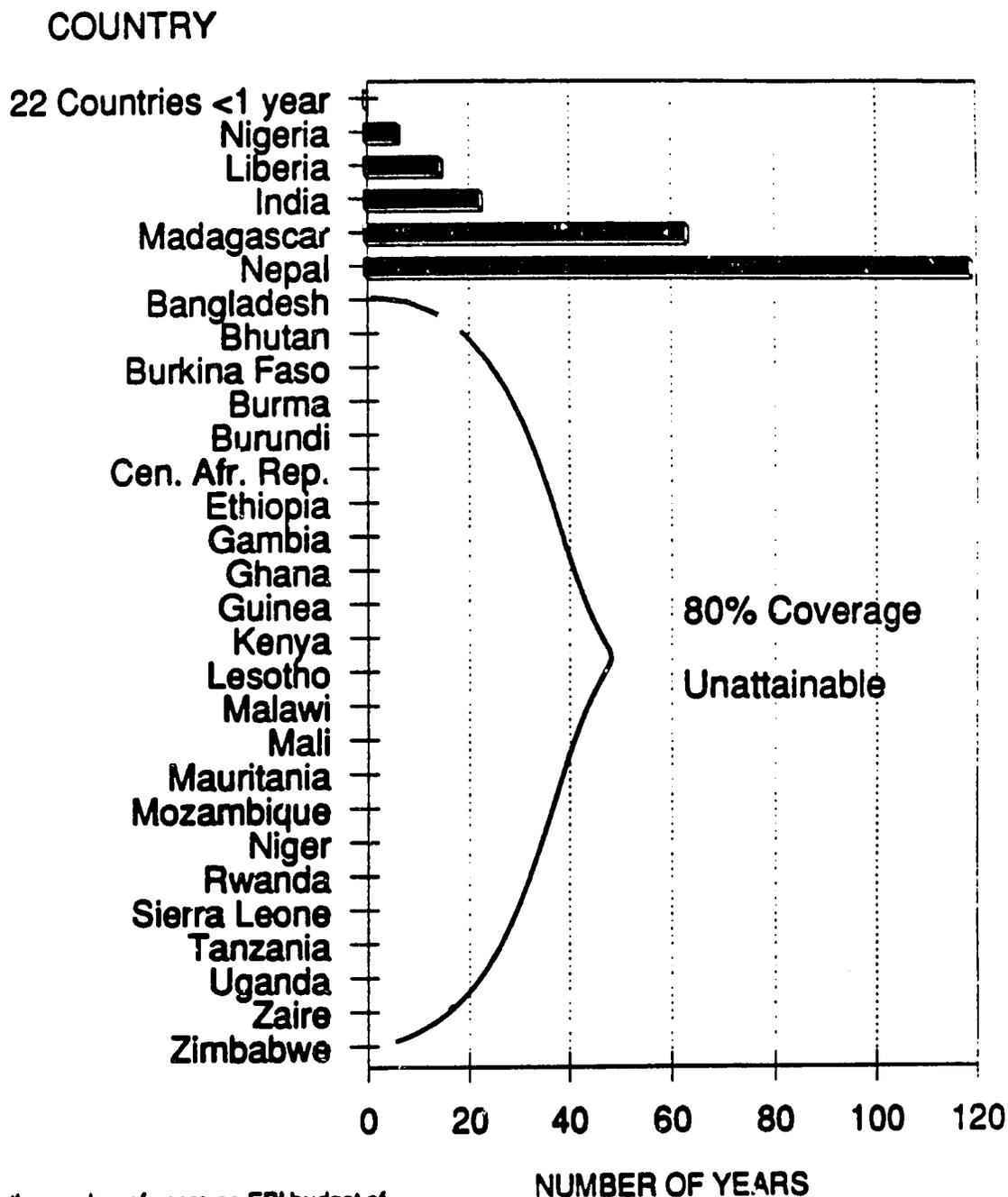
* EPI Expenditure of 0.1% GDP

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Chart 10

NUMBER OF YEARS FROM 1990 TO ATTAIN 80% COVERAGE BASE GROWTH SCENARIO - YEAR 2000

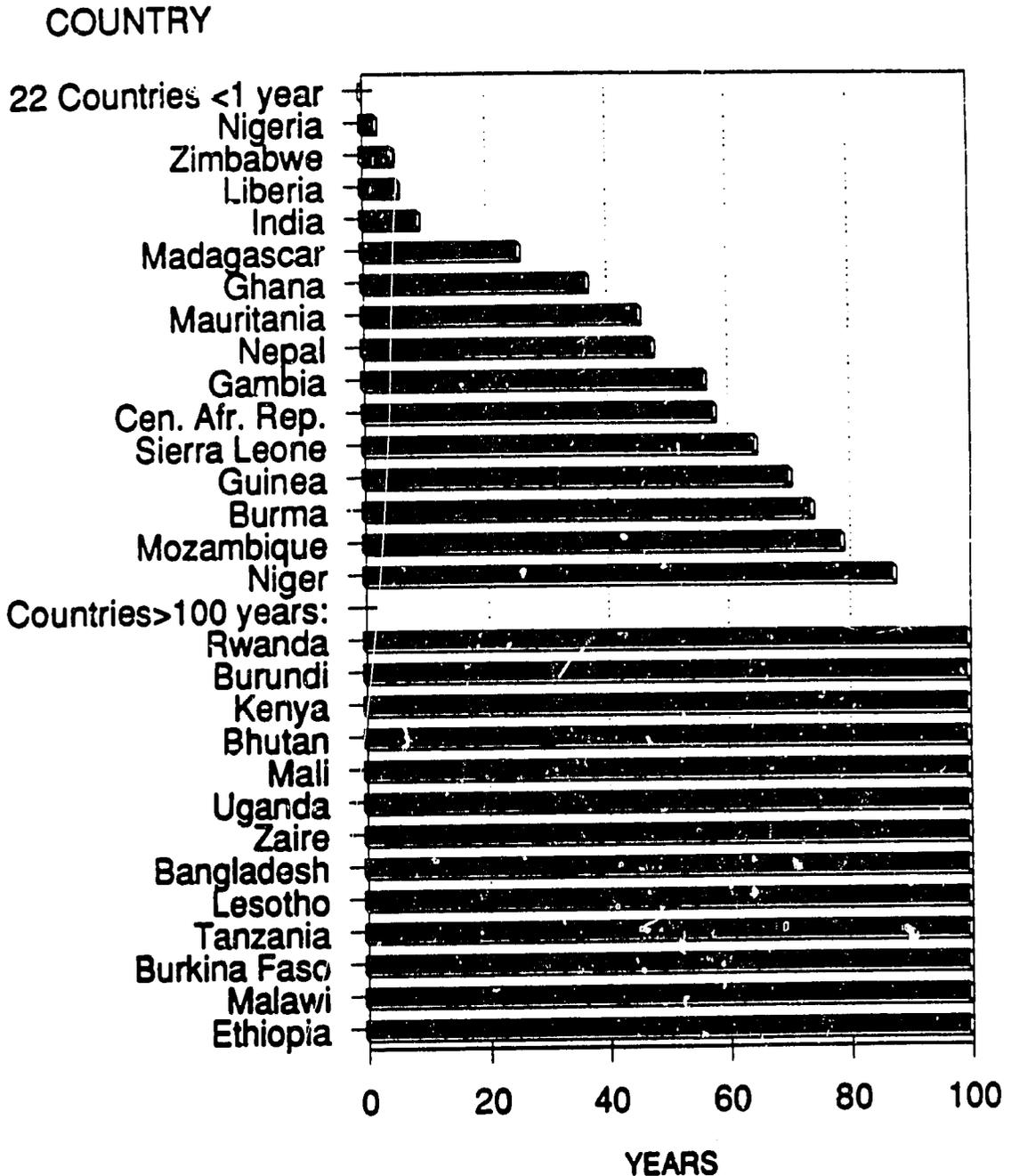


These projections show the number of years an EPI budget of 0.1% GDP needs to meet the cost of immunizing 80% of the target population @ \$15/FIC with the GDP growth rates of each scenario. As the GDP growth rate increases, the number of years required for 80% coverage goes down.

Up

Chart 11

NUMBER OF YEARS FROM 1990 TO ATTAIN 80% COVERAGE HIGH GROWTH SCENARIO

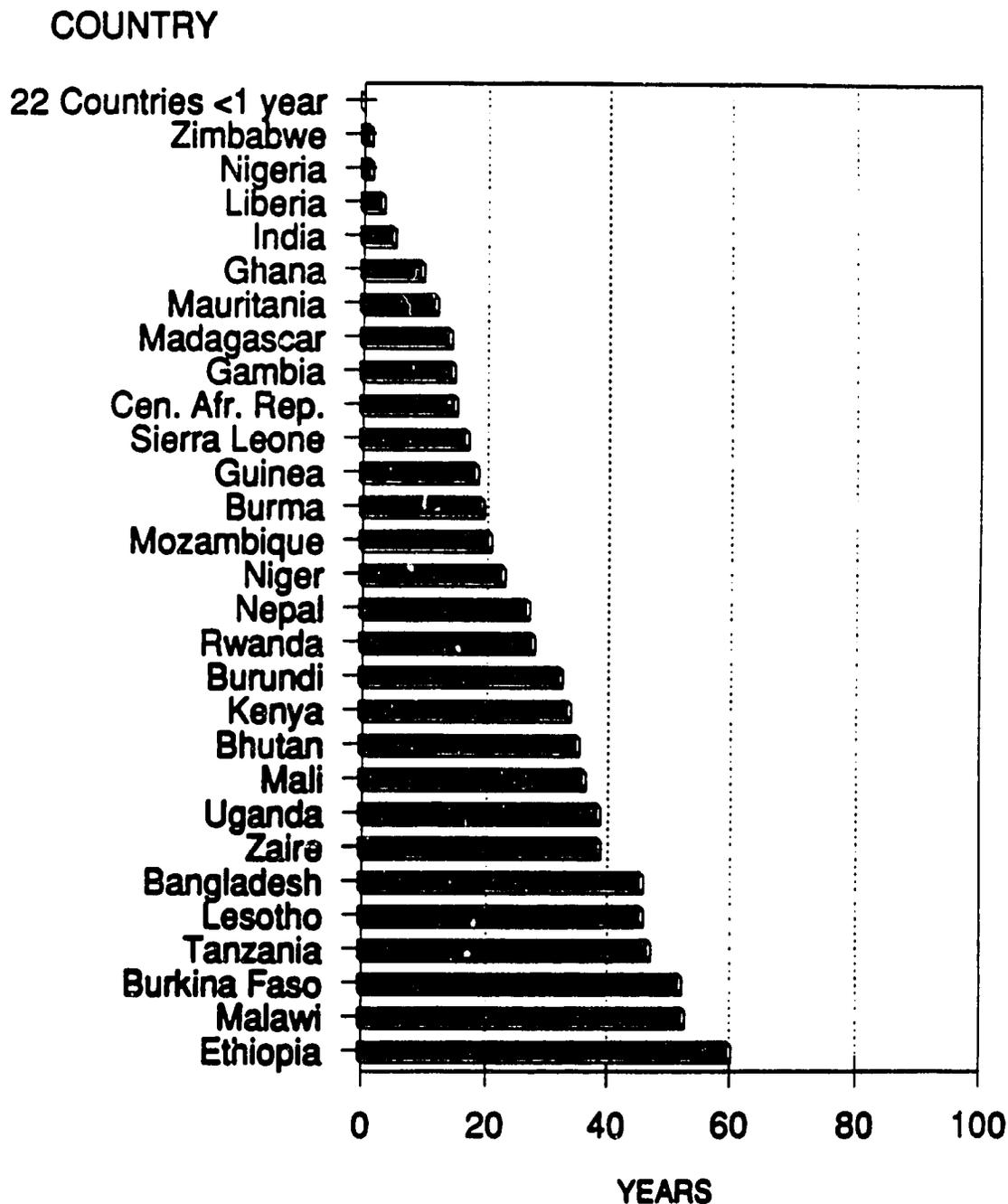


These projections show the number of years an EPI budget of 0.1% GDP needs to meet the cost of immunizing 80% of the target population @ \$15/FIC with the GDP growth rates of each scenario. As the GDP growth rate increases, the number of years required for 80% coverage goes down.

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Chart 12

NUMBER OF YEARS FROM 1990 TO ATTAIN 80% COVERAGE HIGH GROWTH + 2% SCENARIO



These projections show the number of years an EPI budget of 0.1% GDP needs to meet the cost of immunizing 80% of the target population @ \$15/FIC with the GDP growth rates of each scenario. As the GDP growth rate increases, the number of years required for 80% coverage goes down.

AB

REACH REPORTS ON THE ISS

A complete final report of the Immunization Sustainability Study is available which describes fully the methodology and results:

REACH. Immunization Sustainability Study. Arlington, VA: REACH, 1990.

A complete list of references used in Phase I of the Immunization Sustainability Study can be found in the Phase I report:

Brenzel, Logan. The Cost of EPI: A Review of Cost and Cost-Effectiveness Studies (1979-1987). Arlington, VA: REACH, 1989.

These and other REACH reports may be requested by contacting:

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