

70 percent of the investigators in medical research will utilize the laboratory and clinical facilities of institutions of higher education, hospitals, research institutes. In addition, this sector is responsible for the training of postdoctoral fellows and graduate students. For this activity, the creation of expanded research facilities and the renovation of outmoded space will be necessary to accommodate an additional 50,000 persons to be trained in the 1966-75 decade.

This sector's needs for a \$4.3 billion program compares with a projected need for the next decade of about \$500 million for the enlargement of facilities for medical research owned and operated by agencies of the Federal Government and for facilities owned by industrial performers of medical and health-related research.

The Nation's total needs for the 1966-75 period are thus about \$4.8 billion.

(a) Factors taken into account in making projections for the public (non-Federal) and nonprofit sector:

The primary factors determining future requirements for health research facilities are (1) the space required to conduct health-related research; (2) the space requirements for research training; and (3) the requirements for renovation and replacement of existing space.

Estimates of additional space needs for the conduct of research have been derived from estimates of the future growth of health research and the research manpower required to man these future of research activity. The single most important determinant of the growth of medical and health-related research is that of national policy as reflected in the actions of the Federal Government. The impact of such policy decisions is well illustrated by the fact that Federal funds now account for almost two-thirds of the Nation's total expenditures for health research.

The estimated needs for housing the continuing expansion of research training programs are based upon NIH projections of graduate enrollment and Ph. D. output in the sciences related to health; M.D. output; increasing numbers of postdoctoral research fellows and trainees engaged in advanced research training.

In addition to new space to accommodate the growing programs of research and research training, provision must be made for replacement and renovation at levels which will maintain the usefulness and efficiency of existing space for the conduct of modern research and research training programs. In projecting requirements for this purpose an attempt has been made to assess realistically the high rate of obsolescence characteristic of health research facilities in the nonprofit sector because of the necessary accommodation to rapid advances in scientific technology, instrumentation, and architectural design.

In relating the year-by-year projections of required health research space to financial projections, careful attention has been given to the matter of leadtime between obligation of construction funds and the completion and availability of the space being constructed. Estimates of this timelag are derived from the health research facilities program experience, and from NIH analysis of institutional responses to the recent National Science Foundation facilities survey.

The basic projections rest on conservative assumptions that (a) currently used standards of research space per professional worker will