

call attention to the dramatic increase in the rates for both males and females. Mr. Dean E. Krueger of the National Office of Vital Statistics has kindly made available the death rates discussed in this report.

All deaths of females aged 15 to 49 in the U.S. in the single year 1961 attributed to these causes were studied in order to establish with what other diseases they were linked. A list of decedents whose deaths had been coded to I.C.D.¹ numbers 463 (thrombophlebitis of the lower extremity), 464 (thrombophlebitis of other sites), and 465 (pulmonary embolism) was provided by Mr. Krueger. Other conditions listed on the death certificates were shown on the listing.

Deaths certified as having thrombophlebitis of the lower extremity (I.C.D. 463) as the underlying cause almost always bore mention on the certificate of pulmonary embolism as the immediate cause. A great variety of other conditions were listed on about half the certificates, and many of them are recognized as predisposing to thromboembolism. There were no cases that appeared from the evidence on the certificates to be misclassified in the sense of being properly attributable to surgical procedures, trauma, or childbirth; but in the numerous certificates that classified thrombophlebitis as the underlying cause and mentioned such conditions as subacute bacterial endocarditis, rheumatic heart disease, or carcinoma with metastases, the appropriateness of listing thrombophlebitis as the underlying cause may be questioned.

Deaths with thrombophlebitis of other sites (I.C.D. 464) as the underlying cause likewise had pulmonary embolism or infarction generally listed as the immediate cause. The site of thrombophlebitis was frequently the pelvic veins. Other conditions were listed on the certificate much more often than in the case of thrombosis of the lower extremity, and certificates that did not bear one or more other diseases were the small minority. Some certificates were clearly in error, the proper diagnosis being carcinoma, heart disease, blood dyscrasias, trauma, surgery or some other underlying condition. This group was less satisfactory as a series of primary vascular disease than I.C.D. 463.

Under I.C.D. 465, pulmonary embolism and infarction, thrombophlebitis was almost never mentioned on the certificate. About two-thirds of these cases had some other condition listed and in many instances, again, they would be considered as predisposing to thromboembolism. This class is considered to include patients presumed to have a thrombosed vein but without evidence of its site.

Among the more commonly mentioned conditions in association with all three diagnoses were pneumonia, obesity, diabetes, carcinoma, sepsis, prior surgery, rheumatic heart disease, and arteriosclerotic heart disease.

It is concluded that I.C.D. rubric number 463 is the most satisfactory of the three for study of trends of thromboembolism, but even this rubric probably includes some cases that are erroneously charged to thromboembolism by the certifying physician and it certainly includes many with well-recognized predisposing conditions.

For the initial analysis of mortality, the annual rates for each of these diseases (I.C.D. 463-465) as well as I.C.D. 466 (other venous thrombosis and embolism) in the United States were utilized for the period 1960-1966 inclusive, and for five 10-year age classes covering the span from 15 to 65, separately for white males and females. The rates increase approximately logarithmically with age over this age span, and somewhat more steeply in males, in such fashion that the male rates are lower in the youngest age groups and higher in the oldest age groups.

There is also an increase in rates with time, for all age-sex classes. This increase was approximately linear when plotted on semilogarithmic paper; that is, the increase was roughly logarithmic. Therefore, it was decided to take the natural logarithms of the rates and calculate the regression coefficients, fitting the regressions by the method of least squares. These regression coefficients ("b") and their standard errors are shown in Table 1 for the four combined thromboembolic conditions. All the 10 values are positive, indicating an upward trend with time, and all are significantly different from zero at a probability level of 0.05 or less, indicating that the increases are real in a statistical sense.

Comparisons were next made between the slopes for males and females in each age class. For two classes (15-24 and 55-64) the increase in rates for

¹ International Statistical Classification of Diseases, Injuries, and Causes of Death.