include lack of funds, competing disease priorities, weak infrastructure, and work load and protected time to do research. For example, expenditure on science and technology research represents less than 1% of gross domestic product in many low-income countries, compared to over a 5% in several high-income countries. FIGURE 3A.4. However, there is renewed commitment from private and public institutions in high-income countries to help build sustainable research capacity in low-income countries through north-south partnerships.

In addition to regional variation in publication output, there is a mismatch between cancer research output/funding and societal cancer burden. Some common cancer sites, such as pancreas and lung in the United States and Europe, are under-funded and under-studied compared to less common cancers. FIGURE 3A.4. Further, in many countries the bulk of research funding is allotted to basic science, with very little to cancer prevention and control research. Increased cancer research tailored to local disease burdens and knowledge gaps is needed for continued improvement of population health in each country and locality. In low- and middle-income countries, research should focus on identifying local, common risk factors (for example, local alcoholic brews), evaluating preventive interventions, and conducting implementation and operational research. Research in high-income countries should also focus on implementation research as well as biological markers and precision medicine.

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International research collaborations such as the African Research Group for Decoding, a partnership between hospitals and universities in Nigeria, the United States, and the United Kingdom, can advance cancer knowledge and provide evidence and data for making health policy decisions.

For national or regional cancer control programs, research is an essential component of planning, implementation, and monitoring the program’s effectiveness. In addition, research improves patient outcomes and creates national wealth through innovation. However, bibliometrics reveal a large disparity in research activity across countries. FIGURE 3A.4. The United States and a few wealthy European countries account for the majority of publications. Barriers to development of strong, sustainable cancer research output in low-income countries

FIGURE 3A.2
Cancer publications (2002–2013) compared with gross domestic product (GDP)/1000 DALYs

A greater percentage of GDP is spent on cancer research in higher-HDI countries.

According to FIGURE 3A.2, among the 155 countries examined, the United States (6,598 publications, or 10% of the total) received an unusually high percentage of publications, compared to the large number of publications received in other high-income countries. This is reflected in the large disparity in research activity among countries. FIGURE 3A.2. The majority of publications were generated by the United States, followed by Japan (4,043 papers, or 6% of the total) and the United Kingdom (3,687 papers, or 6% of the total). By contrast, low-income countries such as Chad, Sierra Leone, and Namibia generated less than 100 publications each. The proportion of GDP spent on research is the key to understanding the investment in cancer research across countries. FIGURE 3A.1. GDP spent on research varies widely across countries, ranging from 0.1% of GDP in Chad to 1.7% of GDP in the United States, with most countries spending less than 1.0% of GDP on research. FIGURE 3A.1.

The cancer sites associated with the greatest number of DALYs lost do not receive the greatest research funding or number of publications.

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All nations should be producers and users of research.