ABSTRACT I suppose I should establish my bonafides for participation in this symposium. I did participate in 3 Interdepartmental Committee on Nutrition for National Defense (ICNND) surveys as far separated as one on the Blackfeet Indian Reservation (1) in Montana and 2 in Asia—Burma (2) and East Pakistan (3). In fact, the Blackfeet Reservation and Burma surveys were my training grounds for becoming the clinical chief for the East Pakistan survey and later the codirector. More importantly, in 1962, I followed Alan Forbes, who is much missed at this symposium, as the deputy to Arnie Schaefer at ICNND and NIH, and did have experience of an office in the Stone House on the NIH campus. There I participated in the transmutation of the ICNND to the Interdepartmental Committee on National Development and its alignment with the Office of International Research at the NIH and a repositioning within the Department of Health and Human Services. It was from this position that ICNND went on to organize some civilian surveys in the mid-1960s, including those in Central America and Panama (4), and it was from this position that the groundwork was laid for the application of ICNND techniques to the first U.S. domestic survey outside of an Indian reservation, culminating in the Ten State Nutrition Survey (5), which documented that there was hunger in America, as well as abroad. J. Nutr. 135: 1272–1275, 2005.

KEY WORDS: • nutrition surveys • ICNND • Blackfeet Indians • Montana • Burma

I will be making a few comments about the surveys in Asia, Africa, and the Middle East, focusing particularly on the civilian surveys. Bill McGanity’s recollections and observations consider surveys that were done in this hemisphere (6). I would like to share with you one anecdote relating to the survey in Northeast Brazil (7). Part of my job as deputy to Arnie Schaefer in the Interdepartmental Committee on Nutrition for National Defense (ICNND) program at the NIH after I returned from Bangladesh was to be the referral person at the NIH for questions on international nutrition emanating from the State Department. This was a somewhat heavy responsibility for a 27-y-old physician whose total international experience was in ICNND surveys in Burma and East Pakistan. I got to field questions like, “Is there really anything to the suggestion that malnutrition in childhood results in mental retardation?” (we can take up that topic at another occasion) and “How had an idea is it that some South Asian countries are exporting all their high protein foods, such as fish and shrimp?” But the one I remember best, which connects to northeast Brazil and the ICNND survey there, done from March to May 1963, was the question asking if there was any scientific basis for the allegation that skim-milk powder distributed in the poorest part of Brazil under the auspices of the U.S. government and by the U.S. Agency for International Development was causing Brazilian children to go blind. Bahia was strongly leftist, and they had good political reasons for wanting to discredit U.S. aid in any form, including our surplus skim-milk powder. My opinion and response was based on experience in East Pakistan and with the northeast Brazil ICNND survey, in addition to other research. My reply was to acknowledge some of the political motivation for the allegations but to focus on the possible scientific issues. Those included the observations that there was a serious vitamin A deficiency and protein malnutrition in northeast Brazil, as we had observed in East Pakistan, with high numbers of children at risk for keratomalacia and blindness. Part of the problem is delivery of vitamin A to the peripheral tissues in the face of severely depleted stores and very low levels of retinol-binding protein.

1 Presented as part of the symposium “History and Legacy of The Interdepartmental Committee on Nutrition for National Defense (National Development),” given at the 2004 Experimental Biology meeting on April 20, 2004, Washington, DC. The symposium was sponsored by the American Society for Nutritional Sciences. The proceedings are published as a supplement to The Journal of Nutrition. This supplement is the responsibility of the Guest Editors to whom the Editor of The Journal of Nutrition has delegated supervision of both technical conformity to the published regulations of The Journal of Nutrition and general oversight of the scientific merit of each article. The opinions expressed in this publication are those of the authors and are not attributable to the sponsors or the publisher, editor, or editorial board of The Journal of Nutrition. The Guest Editors for the symposium publication are Harold H. Sandstead, The University of Texas Medical Branch, and Gilbert A. Leveille, Cargill Corporation.

2 This paper is published in memory of the director of the East Pakistan Survey, Professor Kamaluddin Ahmad, of Dhaka University, father of biochemistry and nutritional science in East Pakistan/Bangladesh, who died in July 2004.

3 To whom correspondence should be addressed.

E-mail: irwin.rosenberg@tufts.edu.

Irwin H. Rosenberg3
Tufts University Friedman School of Nutrition Science and Policy, Boston, MA

Symposium: History and Legacy of the Interdepartmental Committee on Nutrition for National Defense (National Development)

Interdepartmental Committee on Nutrition for National Defense Surveys in Asia and Africa1,2

I will be making a few comments about the surveys in Asia, Africa, and the Middle East, focusing particularly on the civilian surveys. Bill McGanity’s recollections and observations consider surveys that were done in this hemisphere (6). I would like to share with you one anecdote relating to the survey in Northeast Brazil (7). Part of my job as deputy to Arnie Schaefer in the Interdepartmental Committee on Nutrition for National Defense (ICNND) program at the NIH after I returned from Bangladesh was to be the referral person at the NIH for questions on international nutrition emanating from the State Department. This was a somewhat heavy responsibility for a 27-y-old physician whose total international experience was in ICNND surveys in Burma and East Pakistan. I got to field questions like, “Is there really anything to the suggestion that malnutrition in childhood results in mental retardation?” (we can take up that topic at another occasion) and “How had an idea is it that some South Asian countries are exporting all their high protein foods, such as fish and shrimp?” But the one I remember best, which connects to northeast Brazil and the ICNND survey there, done from March to May 1963, was the question asking if there was any scientific basis for the allegation that skim-milk powder distributed in the poorest part of Brazil under the auspices of the U.S. government and by the U.S. Agency for International Development was causing Brazilian children to go blind. Bahia was strongly leftist, and they had good political reasons for wanting to discredit U.S. aid in any form, including our surplus skim-milk powder. My opinion and response was based on experience in East Pakistan and with the northeast Brazil ICNND surveys, in addition to other research. My reply was to acknowledge some of the political motivation for the allegations but to focus on the possible scientific issues. Those included the observations that there was a serious vitamin A deficiency and protein malnutrition in northeast Brazil, as we had observed in East Pakistan, with high numbers of children at risk for keratomalacia and blindness. Part of the problem is delivery of vitamin A to the peripheral tissues in the face of severely depleted stores and very low levels of retinol-binding protein.

1 Presented as part of the symposium “History and Legacy of The Interdepartmental Committee on Nutrition for National Defense (National Development),” given at the 2004 Experimental Biology meeting on April 20, 2004, Washington, DC. The symposium was sponsored by the American Society for Nutritional Sciences. The proceedings are published as a supplement to The Journal of Nutrition. This supplement is the responsibility of the Guest Editors to whom the Editor of The Journal of Nutrition has delegated supervision of both technical conformity to the published regulations of The Journal of Nutrition and general oversight of the scientific merit of each article. The opinions expressed in this publication are those of the authors and are not attributable to the sponsors or the publisher, editor, or editorial board of The Journal of Nutrition. The Guest Editors for the symposium publication are Harold H. Sandstead, The University of Texas Medical Branch, and Gilbert A. Leveille, Cargill Corporation.

2 This paper is published in memory of the director of the East Pakistan Survey, Professor Kamaluddin Ahmad, of Dhaka University, father of biochemistry and nutritional science in East Pakistan/Bangladesh, who died in July 2004.

3 To whom correspondence should be addressed.

E-mail: irwin.rosenberg@tufts.edu.
protein, along with other plasma proteins. When protein malnutrition is treated with a good source of protein, as skim-milk powder is, which totally lacks fat-soluble vitamins, there have been reports that vitamin A deficiency becomes the rate-limiting nutrient deficiency and xerophthalmia worsens in the short term. There was at least a theoretical basis for the allegation that feeding these malnourished children skim-milk powder without any sources of vitamin A could actually make their eye condition worse. In the interest of full disclosure, I must confess that my observations in the northeast Brazil case were also related to a plea that we had been making based on the East Pakistan survey data showing that 50,000 children there were at risk of blindness because of vitamin A deficiency (7). We were requesting that the skim-milk powder that was distributed there be fortified with vitamin A and possibly D. This was not the responsibility, I was told, of the USDA, and USAID was not convinced that they needed to do it either. Sad in some ways to say, it probably was the northeast Brazil case that persuaded USAID finally to fortify skim-milk powder with vitamin A in the face of the potential political fall-out from the allegations by the communists in northeast Brazil at this critical time in the Cold War.

But I should return to my assigned task, which is to comment on the international ICNND surveys, leaving the details on those in Latin America (4) and the Caribbean (8) to Bill McGanity. Harold Sandstead has already given an excellent overview of the history (9), and I will simply highlight a few points. First, it is noteworthy that the first surveys (10–18) were surveys of armed forces of countries that were allied or friendly. Thus the motivation for the ICNND surveys in the first instance had to do with the negative impact of poor nutrition status on the military of our allies, first in South Korea (12,19,20) and then in other countries. The policy of doing such surveys of armed forces continued into the mid-1960s, but the great concentration was in the late 1950s. Dr. Sandstead has already alluded to some of the interesting findings in the first armed forces surveys (9). We should emphasize that the findings were a window on the nutritional status of the general population to some extent, and follow-on activities were not simply directed to policies relating to Army rations and the Army but to nutritional factors in the country. Indeed, some of these military surveys were used as a way of assessing the impact of interventions, such as fortification with the military sample providing the observation on the impact of a national intervention. So the survey of the armed forces of the Republic of China, or Taiwan if you prefer, was to determine the current nutritional status of the armed forces but also to evaluate the effectiveness of a program of rice enrichment instituted in 1956 (21–23). It was concluded that the premix composed of riboflavin, niacin, and iron was satisfactory in its content and was in fact providing for the main intake and improvement in riboflavin. This is one of many samples in which a primarily military survey served a much larger public health goal. The reciprocal value of surveys in both the armed forces and civilian populations was recognized early, because information about nutrition and agriculture in the country and information about nutritional health status in nonmilitary populations was certainly relevant to the assessment of the health and readiness of the military. But it was also recognized that with only modest additional effort, information about the civilian population could be obtained in countries in which there was going to be a survey of the armed forces. So, as early as 1957 in Libya (18) (that is pre-Khadafi Libya, I should emphasize), the first ICNND survey on both civilian and armed forces was carried out. Indeed, by the early 1960s that became the norm for the ICNND surveys, which also began to emphasize more strongly the agricultural characteristics and even agricultural economics of these countries as part of the assessment of nutritional status. This was particularly important when it came time to make recommendations based on these surveys. It is interesting to note that while some of the earliest recommendations of ICNND surveys of the armed forces were directed to the quality of the rations, the recommendation from the surveys that included both civilians and armed forces placed a greater emphasis on agriculture. Specialists in agriculture and agricultural economics, as essential members of the survey team, were in a position to make recommendations about agricultural policy and priorities and markets that could be based on a much broader set of observations than those that came from nutritional status observations alone. The emphasis on agricultural, botanical, and economic issues as integral parts of the nutritional evaluation may have been among the important and lasting legacies of the ICNND surveys.

Once the value of the rich information emanating from these civilian surveys became apparent, the policy continued to shift away from surveys of armed forces to surveys exclusively in civilian populations. By the early 1960s, ICNND civilian surveys saw some gradual shift in the funding base from Defense to the State and AID and Health and Human Services, and as noted earlier, subtle change in the name with the substitution of the word “Development” for “Defense,” so that the remarkable ICNND trademark would not have to be lost in this shift of orientation. Still, Department of Defense funded 31 surveys and AID funded two (12). The details of this reorientation are described in the reminiscences of Arnie Schaefer (24).

The survey in which I participated in East Pakistan (3), after my training survey in Burma (2), represented many of the

FIGURE 1 East Pakistan Nutrition Survey (3). Note the reciprocal curves of seasonal variation in pulse intake (top) vs. the prevalence of protein malnutrition (bottom).
elements of this major realignment, including the base in the Office of International Research of NIH, the total civilian orientation, and in this case a whole new approach to funding through the public law 480 program, which generated local currencies, in this case Rupees, in "exchange" for agricultural surplus commodities from the United States. It was this extended funding that made it possible for the East Pakistan survey to be not only the largest of the ICNND surveys, with more than 15,000 people in the sample population, but one that could be carried out over an extended period of time (2 y), which made possible, as we will see in a few minutes, some observations about seasonal variation that could not be made with the usual ICNND survey that typically lasted 2 mo. ICNND also used pyridoxal-480 funds for its sponsored research in Egypt, Lebanon, and Jordan by the Vanderbilt Nutrition Group, directed by William J. Darby (25,26), at Naval Medical Research Unit 3.

Dr. Sandstead (9) has already referred to some of the findings in the early military surveys, and Dr. McGanity (6) will refer to many others that were done in this hemisphere. I will make a few observations based upon the experience in East Pakistan (3), which became Bangladesh, after the war for independence in 1971. The data in Figures 1 and 2 illustrate relations of dietary intake of protein-rich pulses and vitamin A-rich foods and the concurrent prevalence of protein malnutrition or deficient serum vitamin A levels. These demonstrate the utility of a longer survey, which permits resurvey in certain geographical locations at different times of the year.

Because agricultural economists on the survey (3) were able to document trends in rice and pulse or lentil production that were detrimental to the availability of dietary protein, along with observations about seasonal variation that could not be made with the usual ICNND survey that typically lasted 2 mo. ICNND also used pyridoxal-480 funds for its sponsored research by the Vanderbilt University Nutrition Group (25) at the U.S. Naval Medical Research Unit #3 in Cairo, Egypt, that resulted in the clinical description of zinc deficiency in 16- to 20-yr-old male farmers (35–40).

Although Barbara Underwood (41) will be talking about lasting legacies, I did want to point out one other important legacy that was embedded in the recommendations after these surveys. Some of you will remember how passionate Arnie Schaefer was about the importance of "follow-up" (42), and so the nature of the reports that followed these surveys needed to have strong practical recommendations that could hopefully be tested in follow-up. One of the common recommendations had to do with fortification of foodstuffs, most commonly salt iodization, because a high prevalence of goiter was a regular finding in these surveys. But another, which was only rarely acted upon, was a strong recommendation that there be an increased focus on nutrition in the government structure of the country. An example is the recommendation to Libya that "the development council appoint a national advisory committee on nutrition composed of authorities in health, nutrition, economics, and agriculture, together with administrators and consumer representatives, and provide it with facilities for the conduct of its work. It should be able to guide at the highest level those responsible for framing national policies." That kind of recommendation was commonly, if not consistently, made in the ICNND survey reports, and I think we all wish that it had been followed in more countries, including our own.

**FIGURE 2** East Pakistan Nutrition Survey (3). Note the reciprocal seasonal variation in vitamin A intake (top) vs. percentage low plasma vitamin A concentration (bottom).
ACKNOWLEDGMENT

This paper is published in memory of the director of the East Pakistan Survey, Professor Kamaluddin Ahmad, of Dhaka University, father of biochemistry and nutritional science in East Pakistan (Bangladesh), who died in July 2004.

LITERATURE CITED


