

# **Appendix 2-A**

## **Sources on Tables Listing Countries of Chemical and Biological Weapon Concern**

**T**ables 2-7 and 2-8 list countries reported in various published sources to have, or to be trying to acquire, chemical or biological warfare capabilities. As indicated in the chapter text, the lists provided there are in no way to be considered authoritative or comprehensive. OTA has merely recorded the countries listed in two-thirds or more of the cited publications. The following tables show not only the countries making this arbitrary cut-off line, but also the other countries mentioned in fewer than two-thirds of the sources. In the case of the chemical warfare program list, this appendix also details the sources cited in the *International Handbook on Chemical Weapons Proliferation* and utilized in the OTA table.

Table 2-A-1—Proliferation Risks: Chemical Weapon Programs Suspected

| Countries    | Harris<br>1989/90 | UNI<br>1989 | NY Times<br>1989 | Time<br>1989 | USNWP<br>1989 | Knight<br>1989 | Chi Trib<br>1989 | McGeorge<br>1989 | McCain<br>1989 | Harris<br>1991 | FIS<br>1991 | Total | %    |
|--------------|-------------------|-------------|------------------|--------------|---------------|----------------|------------------|------------------|----------------|----------------|-------------|-------|------|
| Israel       | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Libya        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Iraq         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Egypt        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Iran         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Syria        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 11    | 100% |
| Taiwan       | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 10    | 91%  |
| Korea, North | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 10    | 91%  |
| Vietnam      | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 9     | 82%  |
| Myanmar      | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 9     | 82%  |
| China        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 8     | 73%  |
| Pakistan     | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 7     | 84%  |
| Korea, South | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 7     | 84%  |
| India        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 6     | 55%  |
| Ethiopia     | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 6     | 55%  |
| Indonesia    | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 4     | 36%  |
| Chile        | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 3     | 27%  |
| Afghanistan  | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 3     | 27%  |
| Thailand     | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 3     | 27%  |
| South Africa | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 3     | 27%  |
| Laos         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 2     | 18%  |
| Brazil       | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 2     | 18%  |
| Cuba         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Argentina    | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Peru         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Angola       | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Chad         | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Philippines  | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| Mozambique   | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 1     | 9%   |
| El Salvador  | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 0     | 0%   |
| Nicaragua    | ?                 | ?           | ?                | ?            | ?             | ?              | ?                | ?                | ?              | ?              | ?           | 0     | 0%   |

? indicates doubt expressed by source.

SOURCE: Adapted by Office of Technology Assessment, 1993, from Gordon Burck and Charles Flowerree, 1991 (see previous page)

## Appendix 2-A-Sources on Tables Listing Countries of Chemical and Biological Weapon Concern 81

### Sources Cited in Table 2-A-1, Proliferation Risks: Chemical Weapon Programs

Sources and Commentary from Gordon Burck and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation* (New York, NY: Greenwood Press, 1991), pp. 164-171:

- DNI( 1989: Director of Naval intelligence, Rear Admiral Thomas Brooks, prepared testimony for the Seapower and Strategic and Critical Materials Subcommittee, House Armed Services Committee, Feb. 22, 1989, pp. 38-39.
- Harris 1989/1 990: Elisa Harris, "Chemical Weapons Proliferation in the Developing World," *RUSI-Brassey's Yearbook 1989* (London: Brassey's Defence Publishers, 1989), p. 74.
- NY Times 1989: Stephen Engelberg, "Chemical Arms: Third World Trend," *New York Times*, Jan. 7, 1989 (not a complete listing). (Source given as U.S. administration officials; ?—France is not mentioned in the article).
- Time 1989: Jill Smolowe, "The Search for a Poison Antidote," *Time*, Jan. 16, 1989, p. 22 (source given as SIPRI).
- USN 1989: Joseph L. Galloway et al., "Bad Chemical Reactions," *U.S. News & World Report*, Jan. 16, 1989, p. 30 (sources for a table that also contains other information are given as ArmControl Association, Federation of American Scientists, and Senate Armed Services Committee).
- Knight 1989: Knight-Ridder news services, James McCartney, "U.S. Sees Threat of Chemicals," *Philadelphia Inquirer*, Jan. 8, 1989, p. F1 (also named Japan, Netherlands and Switzerland—a historical possessor and two states that probably have never possessed CW weapons, making this list unusually unreliable).
- Chi Trib 1989: Thoma Shanker, "West Underwrites Third World's Chemical Arms," *Chicago Tribune*, Apr. 3, 1989, pp. 1,6; and "Lack of Candor Blocks Chemical Arms Treaty," Apr. 4, 1989, pp. 1, 6 (source given as U.S. Government officials).
- McGeorge 1989: Harvey J. McGeorge, "Chemical Addiction," *Defense & Foreign Affairs*, April 1989, pp. 16-19, 32-33.
- McCain 1989: Senator John S. McCain, "Proliferation in the 1990s: implications for U.S. Policy and Force Planning," table 1, *Congressional Record*, Nov. 1, 1989, p. S14605; "Estimates are Based on a Variety of Sources, including unclassified testimony by CIA Director William H. Webster, Seth Carus, David Goldberg, Elisa D. Harris and others and do not reflect the estimates of the U.S. Government." Also published as "Proliferation in the 1990s: implications for U.S. Policy and Force Planning," *Strategic Review*, summer 1989, p. 11.
- Additional sources:  
Harris 1991: Elisa D. Harris, "Towards a Comprehensive Strategy for Halting Chemical and Biological Weapons Proliferation," *Arms Control: Contemporary Security Policy*, vol. 12, No. 2, September 1991, p. 129, which cites statements of U.S. Government officials listing suspect countries.
- FIS 1993: *Russian Federation Foreign Intelligence Service Report: A New Challenge After the Cold War: Proliferation of Weapons of Mass Destruction*, JPRS-TND-93-007.

Table 2-B-I—Proliferation Risks: Biological Weapon Programs Suspected

| Countries    | Carus<br>(Policy Paper) | Harris<br>(USG officials) | Guardian<br>(London) | McGeorge<br>Def. & FA | FIS<br>1993 | ACDA<br>1993 | Total | %  |
|--------------|-------------------------|---------------------------|----------------------|-----------------------|-------------|--------------|-------|----|
| Libya        | ✓                       | ✓                         | ✓                    | ✓                     | ✓           |              | 5     | 83 |
| Korea, North | ✓                       | ✓                         | ✓                    | ✓                     | ✓           |              | 5     | 83 |
| Iraq         | ✓                       |                           | ✓                    | ✓                     | ✓           | ✓            | 5     | 83 |
| Taiwan       | ✓                       | ✓                         | ✓                    |                       |             | ✓            | 4     | 67 |
| Syria        | ✓                       | ✓                         | ✓                    |                       |             | ✓            | 4     | 67 |
| Soviet Union | ✓                       |                           | ✓                    | ✓                     |             | ✓            | 4     | 67 |
| Israel       | ✓                       |                           | ✓                    | ✓                     | ✓           |              | 4     | 67 |
| Iran         | ✓                       | ✓                         |                      | ✓                     | ✓           |              | 4     | 67 |
| China        | ✓                       | ✓                         | ✓                    |                       |             | ✓            | 4     | 67 |
| Egypt        |                         |                           | ✓                    |                       | ✓           | ✓            | 3     | 50 |
| Vietnam      |                         |                           | ✓                    |                       |             |              | 1     | 17 |
| Laos         |                         |                           | ✓                    |                       |             |              | 1     | 17 |
| Cuba         |                         |                           |                      | ✓                     |             |              | 1     | 17 |
| Bulgaria     |                         |                           |                      | ✓                     |             |              | 1     | 17 |
| India        |                         |                           |                      |                       | ✓           |              | 1     | 17 |

SOURCE: Compiled by Office of Technology Assessment, 1993, from various source. See text below.

Detailed listing of sources for table 2-A-1: David Fairhall, "Eleven Countries Defying Ban on Germ Weapons," *The Guardian* (London), Sept. 5, 1991, p. 1.; Elisa Harris, "Towards a Comprehensive Strategy. . .," op. cit., p. 129; Seth Carus, " 'The Poor Man's Atomic Bomb' ". . .," op. cit., p. 25; and Harvey J. McGeorge, "Chemical Addiction," *Defense and Foreign Affairs*, April 1989, p. 17; Russian Federation Foreign Intelligence service, op. cit., and U.S. Arms Control and Disarmament Agency, "Adherence to and Compliance with Arms Control Agreements and The President's Report to Congress on Soviet Noncompliance with Arms Control" (Washington, DC: ACDA, January 14, 1993).