

Description of shock data

Background: The objective is to study the effect of various physiological variables, including different types of shock, on the survival of critically ill patients.

Summary: At the Shock Research Unit of the University of Southern California, data were collected at the time of admission for 113 critically ill patients. In addition, for each patient the final status status (and cause of death, if he/she did not survive) was recorded.

Data description:

Column	Variable	Units	Scale	Comments
1-4	ID	none	Nominal	Patients numbered sequentially
5-8	Age	yr	Ratio	
9-12	Height	cm	Ratio	Age at last birthday
13-15	Sex	none	Nominal	1 = Male, 2 = Female
16	Survival	none	Nominal	1 = Survived, 3 = Died
17-20	Shock type	none	Nominal	2 = Nonshock
				3 = Hypovolemic shock
				4 = Cardiogenic shock
				5 = Bacterial shock
				6 = Neurogenic shock
				7 = Other
21-24	Systolic pressure	mm Hg	Ratio	Recorded to nearest integer
25-28	Mean arterial pressure	mm Hg	Ratio	Recorded to nearest integer
29-32	Heart rate	beats/min	Ratio	Discrete variable
33-36	Diastolic pressure	mm Hg	Ratio	Recorded to nearest integer
37-40	Mean central venous pressure	mm Hg	Ratio	Decimal between cols. 39, 40
41-44	Body surface area	m ²	Ratio	Decimal between cols. 42, 43
45-48	Cardiac index	liters/min/m ²	Ratio	Decimal between cols. 46, 47
49-52	Appearance time	sec	Ratio	Decimal between cols. 51, 52
53-56	Mean circulation time	sec	Ratio	Decimal between cols. 55, 56
57-60	Urinary output	ml/hr	Ratio	Recorded to nearest integer
61-64	Plasma volume index	ml/kg	Ratio	Decimal between cols. 63, 64
65-68	Red cell index	ml/kg	Ratio	Decimal between cols. 67, 68
69-72	Hemoglobin	gm	Ratio	Decimal between cols. 71, 72
73-76	Hematocrit	percent	Ratio	Decimal between cols. 75, 76
77-79	Blank			
80	Card sequence	none	Ordinal	1 = Initial, 2 = Final

Interpretation of the variables:

Shock Type

- Hypovolemic: Loss of body fluids
- Cardiogenic: Misfunction of heart
- Bacterial: Toxins released by bacteria
- Neurogenic: Injury to central nervous system

Systolic blood pressure: Pressure in arteries (flow x resistance; greater if heart is pumping harder) during contraction of heart.

Diastolic blood pressure: Pressure in arteries during relaxation of heart.

Mean arterial/venous pressure: More accurate measure of blood pressure.

Cardiac index: (liters pumped / minute) / (body surface area). The higher, the better. (In shock, the heart can't pump as well).

Appearance time: The time for a significant amount of dye to appear in an opposite limb of injection site. Low values show that the "pump and pipe system" (heart and blood vessels) are working well.

Mean circulation time: Average time for blood to make a complete circuit; small values desirable.

Urinary output: Measure of kidney function; high values are preferable.

Plasma volume: Measure of the amount of liquid in the circulatory system; high values are preferable.

Red cell index: Measures oxygenation; should be high.

Hemoglobin: Component in red cells which transfers oxygen; should be high (but not too high).

Hematocrit: Measures the ratio of red cells to volume; should be high.

Sources:

A. A. Afifi, S. P. Azen (1972), "Statistical Analysis: A Computer - Oriented Approach", p. 16 ff.

M. Brandfonbrener, M. Landow-Ne, N. W. Shock, "Changes in Cardiac Output with Age", *Circulation*, Vol XII, October 1955. (see [cardiac.output.pdf](#))