

Crystals worth millions of sneezes

It's a gem of a cold. The virus causing one type of the common sniffles has been successfully crystallized into prisms, each containing more than ten thousand million viruses. The crystals will be used to investigate the structure of the disease-causing agent. They have already revealed an intriguing similarity between the virus, called rhinovirus 14, and the virus that causes polio, say scientists at Purdue University in West Lafayette, Ind., and the University of Wisconsin in Madison.

A report in the February PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Number 4) describes the second instance of crystals made up of cold-causing viruses, says Michael G. Rossmann of Purdue. In an earlier attempt, crystals were produced of another of the more than 100 types of rhinovirus. But those hexagons were too small to examine by X-ray diffraction, the powerful technique for studying microscopic, regular structures. The



Rossmann et al.

Cold-virus crystals are up to 0.6 mm long.

new work allows rhinovirus 14 to be examined at a resolution of 3.5 angstroms. The virus is an icosahedron — a regular polyhedron with 20 sides — and is 300 Å in diameter.

"The crystals formed by rhinovirus and by polio virus are very, very similar," Rossmann says. "In a crystal, the viruses are put down in a regular array like bricks

in a wall. The arrangement of virus in both the rhinovirus 14 case and the poliovirus case must mean the surfaces of the viruses are very similar." He says this finding is not entirely surprising because the viruses come from the same family, called picornaviruses. Yet their surface properties had seemed quite distinct. The two viruses infect different tissues and bind to different antibodies. Scientists had also thought that poliovirus is bigger than rhinovirus 14, but now find this is not the case, Rossmann says.

So far the scientists have compared the viruses at a resolution of 30 Å. "We are interested in increasing this resolution," Rossmann says. He and colleagues John W. Erickson and Elizabeth Frankenberg of Purdue and G. Shay Fout, K. C. Medappa and Roland R. Ruekert of Wisconsin plan to examine structural differences between rhinoviruses and enteroviruses, the subgroup that includes poliovirus. They say such comparisons should also help elucidate evolutionary relationships of the viruses and clarify how their surface chemistry determines tissue and antibody specificity. —J. A. Miller

New weight-height chart: It's OK to weigh a little more than before

For the third time this century, the ideal weight-to-height chart that hangs on doctors' office walls has been revised. And it allows people to weigh a few more pounds than the last one did.

Compared with the last chart, in 1959, the new one indicates that short men can weigh 13 more pounds, medium-height men seven more pounds and tall men two more pounds. Short women can weigh 10 more pounds, medium-height women eight more pounds and tall women three more pounds. However, all the new ideal weights are still below the average of what people actually weigh.

The study on which the new chart is based was conducted by the Society of Actuaries and the Association of Life Insurance Medical Directors of America. Between 1954 and 1972 it followed four million people to see which weights-per-height were linked with the lowest mortality. Study results were published in 1979. Then Frederic Seltzer, assistant actuary for the Metropolitan Life Insurance Co. in New York City, with the help of other company statisticians and the company's medical department, analyzed the results and worked up a chart indicating the ideal weight-per-height for optimum longevity. The chart (see illustration) was issued by Metropolitan Life last week.

The ideal weights-per-height may have shifted upward, says Paul S. Entmacher, chief medical director of Metropolitan Life, because people are today more conscious of risk factors like cholesterol, smoking and lack of exercise than they used to be. And as they decrease these risk factors, they offset the ability of excess

Men	Height		Small Frame	Medium Frame	Large Frame	Women	Height		Small Frame	Medium Frame	Large Frame
	Feet	Inches					Feet	Inches			
	5	2	128-134	131-141	138-150	4	10	102-111	109-121	118-131	
	5	3	130-136	133-143	140-153	4	11	103-113	111-123	120-134	
	5	4	132-138	135-145	142-156	5	0	104-115	113-126	122-137	
	5	5	134-140	137-148	144-160	5	1	106-118	115-129	125-140	
	5	6	136-142	139-151	146-164	5	2	108-121	118-132	128-143	
	5	7	138-145	142-154	149-168	5	3	111-124	121-135	131-147	
	5	8	140-148	145-157	152-172	5	4	114-127	124-138	134-151	
	5	9	142-151	148-160	155-176	5	5	117-130	127-141	137-155	
	5	10	144-154	151-163	158-180	5	6	120-133	130-144	140-158	
	5	11	146-157	154-166	161-184	5	7	123-136	133-147	143-163	
	6	0	149-160	157-170	164-188	5	8	126-139	136-150	146-167	
	6	1	152-164	160-174	168-192	5	9	129-142	139-153	149-170	
	6	2	155-168	164-178	172-197	5	10	132-145	142-156	152-173	
	6	3	158-172	167-182	176-202	5	11	135-148	145-159	155-176	
	6	4	162-176	171-187	181-207	6	0	138-151	148-162	158-179	

Weights at Ages 25-29 Based on Lowest Mortality. Weight in Pounds According to Frame (and with 5 lbs. Clothing for Men, 3 lbs. for Women and in 1"-Heeled Shoes).

weight to cause heart attacks, stroke or diabetes. In contrast, Reubin Andres, clinical director of the National Institute on Aging, believes that the ideal weights may have increased because mild degrees of excess weight are not as harmful as they used to be. Body fat has both beneficial and harmful effects, he points out, so it "could be that the harmful effects are somewhat diminished now."

The weights in the new chart, Entmacher cautions, "do not necessarily indicate the weights that will reduce the likelihood of illness. Nor are the weights those ... at which a person looks his best." They are merely statistical ranges inside which the longest-lived people fit. The new weights, he adds, also do not mean that people "have a license to gain." They simply indicate that "many people may have

fewer pounds to lose."

The American Heart Association has reacted to the new chart with this statement: "In a population in which obesity and cardiovascular disease are major health problems, it does not seem prudent to raise the limits for recommended weight until more data are available."

In 1980, William B. Kannel of Boston University Medical Center and his colleagues found that within each age group extremely thin, as well as extremely fat, people have higher mortality rates (SN: 5/10/80, p. 294). Kannel believes that the new weight chart reflects the same message that the old one did, and that his own research results reflect as well. And it is this: People should strive to be neither excessively overweight nor excessively underweight. —J. A. Treichel