

# Incidence of Intestinal Protozoa among Patients of the University Hospital at San Juan, Puerto Rico<sup>1</sup>

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A TOTAL OF 1,780 fecal specimens from an equal number of individuals of all ages was examined for the presence of cysts and trophozoites of intestinal protozoa. Of the individuals examined, 567 were hospitalized and 1,213 were ambulatory patients of the University Hospital. Approximately two thirds of these patients resided within the area comprising the districts of San Juan, Santurce, and Hato Rey, and the neighboring towns of Río Piedras, Cataño, and Bayamón. Of these two thirds, more than half lived in the city and suburbs of San Juan; the remaining third of the total resided in other parts of the Island, rural as well as urban.

The age of the stools at examination varied from a few minutes or hours, if obtained from hospitalized patients, to one, two, or three days, if obtained from ambulatory patients coming to the clinics. One 22 x 22 mm. smear preparation in physiological saline solution (0.85 percent) was made from each sample and examined under low and high power magnifications. If cysts were found, a second smear was made in iodine solution (2 percent iodine in 4 percent potassium iodide) for their identification.

Of the 1,780 fecal specimens examined, 554 (31.12 percent) were found positive for intestinal protozoa. Eight different species were recovered, with *Endamoeba coli* occupying first and *Balantidium coli* last places in order of frequency. The incidence for cysts and trophozoites of each of the protozoan species recovered is presented in the table on the following page.

The percentages of infection obtained from the present series of examinations in no way represent the actual incidence of intestinal protozoa in Puerto Rico. Inasmuch as city dwellers greatly outnumbered rural dwellers among the individuals examined, the group does not constitute a representative sampling of the general population. The results are undoubtedly quite conservative, mainly be-

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TABLE 1

Percentages of Infection with Intestinal Protozoa in 1,780 Fecal Specimens

	Cysts Only		Trophozoites Only		Cysts and Trophozoites		Total Positives	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
<i>E. coli</i>	301	16.91	12	0.67	11	0.62	324	18.20
<i>E. nana</i>	189	10.62	1	0.05	1	0.05	191	10.73
<i>E. histolytica</i>	41	2.30	5	0.28	0	0.00	46	2.58
<i>I. williamsi</i>	25	1.40	0	0.00	0	0.00	25	1.40
<i>G. lamblia</i>	74	4.16	0	0.00	1	0.05	75	4.21
<i>T. hominis</i>			24	1.35			24	1.35
<i>Ch. mesnili</i>	6	0.34	13	0.73	2	0.11	21	1.18
<i>B. coli</i>	0	0.00	4	0.22	0	0.00	4	0.22

cause of the fact that the simple smear examination of a single unpurged stool specimen may be expected to reveal only from one third to one half of the total number of protozoan species ultimately discovered by repeated examinations.<sup>2</sup> In addition, since the fecal samples of the ambulatory patients were at least a day old upon arrival at the laboratory, many trophic protozoa were undoubtedly missed in their stools. The possibilities of recovering trophic forms in stale feces are small. The data do suggest, however, a markedly lower percentage of infection with intestinal protozoa in the larger urban and suburban areas of Puerto Rico, such as those of San Juan and Santurce, than reported for the Island in previous studies based on either rural, urban, or mixed rural and urban populations.

It is obvious that a true picture of the incidence of intestinal protozoa in Puerto Rico may be obtained only through a much more complete and thorough study than has been thus far undertaken. Such a study should include not only a larger and more representative sampling of the entire population but also the application of an effective technique for the concentration of cysts—such as the Faust zinc sulphate flotation—besides the smear methods, and the examination of more than one stool specimen per individual.

<sup>2</sup> J. Andrews, Incidence of intestinal protozoa with special reference to the epidemiology of amoebiasis in the population of Fresnillo, Zacatecas, México. Am.J.Hyg., 19:713-733, 1934.

TABLE 2  
Incidence of Intestinal Protozoa among Various Groups of Puerto Ricans, Based on Single Unpurged Stool Examinations

Investigator; Date of Investigation	Number of Individuals Examined	Description of Population	Method of Examination	Percentages of Infection with the Different Species								
				<i>E. coli</i>	<i>E. nana</i>	<i>E. histolytica</i>	<i>I. williamsi</i>	<i>G. lamblia</i>	<i>T. hominis</i>	<i>Ch. mesnili</i>	<i>B. coli</i>	
Hegner <sup>a</sup> 1921	83	Urban, suburban and rural	One smear, half unstained and half stained with iodine	36.14	7.23	10.84	6.02	9.64	3.61	3.61	0.00	0.00
Hill <sup>b</sup> 1927	269	Urban, suburban and rural	Two smears in dilute eosin solution, followed by an iodine-stained smear if cysts were found	42.00	23.90	10.40	13.40	12.70	0.00	3.30	0.00	0.00
Poindexter <sup>c</sup> 1933	564	Not known	One smear, first unstained and then stained with iodine, and one culture	46.00		12.40						
Faust, <sup>d</sup> Hoffman <i>et al</i> 1934	1003	Urban, suburban and rural, mostly rural	Two smears, one unstained and one iodine-stained, followed by iodine-stained centrifugized concentrates	34.20	16.30	14.50	3.50	14.30	0.00	0.70	0.20	0.20
Acosta 1945	1780	Urban, suburban and rural, mostly urban and suburban	One smear in saline solution, followed by an iodine-stained smear if cysts were found	18.21	10.74	2.58	1.40	4.21	1.35	1.18	0.22	0.22

<sup>a</sup>R. W. Hegner. J.A.M.A., 77:1439-1440, 1921.

<sup>b</sup>C. M. Hill and R. B. Hill. Am.J.Hyg., 7:134-146, 1927.

<sup>c</sup>H. A. Poindexter. P.R.Jour.Pub.Health & Trop.Med., 9:31-43, 1933.

<sup>d</sup>E. C. Faust, W. A. Hoffman, C. A. Jones, and J. L. Janer. P.R.Jour.Pub.Health & Trop.Med., 9:447-491, 1934.