

Chapter 8 Data collected for this project

8.1 Summary of key findings

We received data relating to the economic activity of 199 institutions from 35 countries in the five regions covered by participating science center network organisations: North America (81 institutions or 41% of all responses), Latin America & the Caribbean (13 institutions—7%), Europe & the Middle East (50 institutions—25%), the Asia–Pacific region (54 institutions—27%) and Southern Africa (1 institution—0.5%). Overall, this represents more than 25% of the combined membership of the relevant regional network organisations.

The survey questions asked for data based on a single financial year. We received data relating to financial years ending at various times from 2001 to 2003. Thus the aggregates reported should be considered as indicative of recent annual figures rather than as an accurate picture of a particular year.

Participating institutions were predominantly (75%) science centers or science museums; this chapter uses the term ‘science centers’ for these institutions. Other respondent institutions included aquariums, botanic gardens, children’s museums, natural history museums, planetariums and a zoo—we refer to these collectively in this chapter as ‘other institutions’ when providing data breakdowns by institution type.

Participating institutions ranged in size—total interior public floor space—from 50 square metres to 150,000 square metres (540 square feet to 1.6 million square feet), with a median size worldwide of 4,150 square metres (44,600 square feet). Nearly half (47%) of all respondents had some outdoor space for public use, with the size of this space ranging from 100 square metres to nearly 180,000 square metres (1,075 square feet to 1.9 million square feet). Larger percentages of institutions in the Asia–Pacific region (80%) and in Latin America & the Caribbean (85%) had outdoor space than in North America (25%) or Europe & the Middle East (35%).

Opening dates for participating institutions ranged from 1824 to 2004, with one respondent planning to open in 2008. Half of the respondent institutions have opened since 1985, and a quarter since 1994. Current patterns suggest that in all regions the growth in the number of such institutions, which began in the 1970s, is continuing.

A large majority (89%) of participating institutions reported that they charge an admission fee.

Worldwide, 191 respondents reported a total operating expenditure of more than US\$1,100 million⁴; 169 respondents reported revenue totalling \$1,010 million. The mean annual expenditure was \$5.81 million, compared with mean revenue of \$5.96 million. Median values for expenditure and revenue were \$1.75 million and \$1.74 million respectively.

Most respondents reported positive or break-even financial outcomes. Worldwide, 61% of respondents reported an excess of revenue over expenditure and another 13% reported expenditure equal to revenue.

Sources of revenue varied on a regional basis. Worldwide, 43% of revenue was earned income, 41% came from public funding sources and 15% was from private funding sources. The pattern in Europe & the Middle East and in Latin America & the Caribbean was similar, with 43–44% of revenue being earned income but with slightly less support from private funding sources (7% and 11 % respectively) and a correspondingly higher percentage of revenue being from public funding sources. In North America, earned income accounted on average for 50% of revenue and public funding for only 26%, with private funding sources supplying a higher percentage (24%) of revenue than in any other region. In the Asia–Pacific region on the other hand, public funding sources supplied the majority (74%) of revenue, with earned income making up most (21% of the total) of the remainder and private funding sources accounting for just 5% of revenue.

Capital expenditure for one year totalled \$308 million in 128 institutions worldwide (excluding the reported cost of setting up a large new center).

Worldwide, 171 institutions had a total of 16,879 paid employees: 10,756 (64%) of them worked full time; and 6,123 (36%) of them worked part time in 135 of the respondent institutions. In addition, 119 institutions reported the involvement of a further 26,546 people as volunteers, making a total of over 43,400 people directly involved in the work of these institutions.

Institutions in North America made greater use of part-time staff than those in other regions—46% of all paid employees compared with around 30% in Europe & the Middle East and Latin America & the Caribbean, and with 21% in the Asia–Pacific region. North American institutions also made greater use of volunteers. The median number of volunteers in a respondent institution in North America was 266, compared with 77 in Europe & the Middle East, 61 in Latin America & the Caribbean, and 27 in the Asia–Pacific region.

⁴ All financial data in this chapter are presented in US dollars.

On average—for all respondents taken together—54% of operating costs were devoted to staff-related expenditure. On a regional basis, only Europe & the Middle East varied noticeably from this pattern, with 45% of operating costs being for staff-related expenditure.

Worldwide, 193 institutions reported total attendances of nearly 77 million, with the mean number of visits being 398,337 and the median number being 259,694. Of these visits, 61.8 million were on-site visits, with the number of on-site visits ranging from 227 for an outreach-focused center to 2.85 million for a large capital city institution. The median number of on-site visits was 200,130 and the mean was 320,156.

Nearly two-thirds of respondents (62%, or 122 institutions) reported off-site visitors as well. Worldwide, the total number of off-site visits reported was over 15 million, with the numbers for individual institutions ranging from 100 visitors to 5 million. The median number of off-site visits was 51,980 and the mean was 123,689.

An important factor for an economic impact study is the number of visitors that an institution attracts from outside its local region (e.g. city, county or state), as spending by these visitors contributes 'new' money to the region's economy. For this project, 141 institutions provided estimates of the percentage of out-of-region visitors ranging from 5% to 98% (with a median value of 36% and a mean of 39%). While each institution would need to assess its own situation, these figures suggest that spending by out-of-region visitors would make a valuable contribution to the local economy for many of the respondent institutions.

As well as breaking down the data by region, we have also provided some breakdowns by institution type (science centers compared with all other institution types) and by size (using four size categories based on but not identical to those used in the ASTC 2004 member survey). Some comparisons are made on the basis of institution type or size, but these probably have limited validity because of the small sizes of several of the subgroups. We have not done any analysis of the statistical significance of differences between regional or other groupings of respondents.

We have calculated four 'performance ratios' for all respondent institutions worldwide, and for all respondent institutions in each region. Median and mean values for all respondents worldwide were:

- number of on-site visits per square metre of interior public space: median 51, mean 72
- number of visits per full-time equivalent employee, based on the total number of on-site plus off-site visits: median 5,390, mean 6,221
- operating cost per square metre of interior public space: median \$760, mean \$1,106
- operating cost per visit, based on total of on-site plus off-site visitors: median \$12, mean \$14.

8.2 The survey and the respondents

As part of this study, a survey questionnaire (see Appendix 3) was sent during April–June 2004 to over 700 institutions, to gather data on expenditure and visitor numbers as a baseline for related studies in the future. The questionnaire was distributed by the executive directors of a number of regional networks of science centers, and respondents have been classified according to geographical regions corresponding to these networks.

We received 103 direct responses, including one from the National Council for Science Museums in India, which provided aggregated data for 28 science centers. In addition, ECSITE-UK provided data for a further 20 science centers in the United Kingdom, and 49 ASTC members gave permission for data that they provided for the recent ASTC member survey (ASTC 2004a) to be used in this study. In total, then, we have 199 responses from 35 countries.

Table 8-1 shows the number of members on each network's mailing list when the survey was distributed, and the number of responses received from each region. The actual number of potential responses was fewer than the total of 771 shown in the table, as some institutions are members of more than one network organisation. The extent of this overlap is not known.

The collated data should provide a sound baseline for further research on a worldwide basis and within the regional networks, although we cannot be sure how representative the responding institutions are of the total membership of the regional networks; and there are many institutions that do not belong to any of these networks.

Table 8-1 Number of surveys distributed and responses received, by region

Region	Network	Number of surveys distributed	Number of responses received from region (and percentage return)	Countries represented in survey (and number of respondents)
North America	ASTC CASC	402	81 (20%)	Canada (4), United States (77)
Latin America & the Caribbean	Red-POP	39	13 (33%)	Argentina (2), Brazil (1), Chile (1), Colombia (1), Mexico (5), Panama (1), Venezuela (1), Trinidad and Tobago (1)
Europe & the Middle East	ECSITE ECSITE-UK	250	50 (20%)	Belgium (1), Denmark (2), Finland (2), France (3), Germany (2), Iceland (1), Israel (2), Italy (3), Portugal (1), Sweden (4), Switzerland (2), United Kingdom (27)
Asia-Pacific region	ASPAC ASTEN NCSM *	27 15 28	54* (77%)	Australia (6), Brunei (1), China (2), India (28), Japan (2), Malaysia (2), New Zealand (4), Philippines (3), Republic of Korea (1), Singapore (1), Taiwan (2), Thailand (2)
Southern Africa	SAASTECC	10	1 (10%)	South Africa (1)
TOTAL		771	199 (>25%)	

* One aggregated response was received, covering the 28 science centers in India's National Council of Science Museums. The total of 54 for the Asia-Pacific region represents these 28 centers plus 26 institutions in other countries in the region.

Relationship between this survey and the 2004 ASTC member survey

Our data are essentially a subset of those collected by the ASTC in its 2004 member survey, with a different but overlapping respondent population. As far as possible, the data are presented here in a way that allows cross-referencing with the ASTC data.

The 2004 ASTC member survey attracted 185 responses: 154 were from institutions in the United States and the remaining 31 represented 20 other countries. Of the 185 ASTC respondents, 43 also replied to this project's survey, and a further 49 gave permission for data provided to the ASTC survey to be used here. Thus 92 institutions are represented in both surveys—roughly half of the respondents in each case.

Data in the ASTC survey report (ASTC 2004b) are in some cases broken out according to four dimensions:

- location—two categories: *US* and *Other countries*
- type of institution—two categories: *Science centers* and *All others*
- size of institution based on interior exhibit space—four categories, different from those used in previous ASTC surveys
- operating expenses—four categories.

These categories have been selected by the ASTC as most likely to help its members find information about 'other science centers like mine'.

Data in this report are presented using similar but not identical categories:

- location—four regions: North America, Latin America & the Caribbean; Europe & the Middle East; Asia-Pacific, as set out in Table 8-1
- type of institution—two categories: *Science centers* and *All others*, as used by the ASTC
- size of institution—four categories, using the same size groupings as used by the ASTC in 2004, which are different from those used in previous ASTC surveys (ASTC 2001, 2002), but based on total interior public space rather than total interior exhibit space
- operating expenses—four categories as used by the ASTC.

Different categories

This report and the 2004 ASTC survey report use different categories for the locations of surveyed institutions, and for their sizes.

8.3 How the data are reported

Institution sizes (total interior public space) are given in both square metres and square feet (1,000 square feet = 93 square metres).

Financial information is in US dollars. For the small number of institutions that provided data in other currencies, the conversion was done at the time the survey response was received (mid-2004).

Respondents were asked to provide data for the most recently completed financial year (assumed to be mostly 2003). However, data for some of the UK science centers, obtained directly from ECSITE-UK, were collected in 2002 and some may relate to financial years ending in 2001. ECSITE-UK has pointed out that the introduction of free entry to national museums and some others has increased attendance since those data were collected; on the other hand, for some of the centers that opened in the millennium period, early 'honeymoon' attendances reported in 2001 have since stabilised at lower levels.

Not all respondents provided answers to all questions. Thus the number of respondents varies from one data table to another—in each case, the number given represents the number of responses received to the particular question(s) under consideration.

The data from the one South African response are included in the *All respondents* figures in relevant tables, but are not shown separately in the region-based breakdowns, as the distribution analysis has no meaning for a single respondent.

Three of the respondent institutions, while involved in science communication activities, do not have exhibitions. These institutions are not included in the tables relating to operating revenues and costs, visitor numbers and staff numbers, as they are not directly comparable to institutions with exhibitions open to the public.

In general, mean (arithmetic average), minimum and maximum values are reported for the quantities surveyed. Where appropriate, median values and the 25th and 75th percentile values are also given. These values give a clearer picture of the spread of numbers across respondent institutions, since the mean can be distorted by a few very low or very high numbers among the responses. The median value (50th percentile) of, for example, total visitor numbers across all institutions is such that 50% of institutions have a larger number of visitors and 50% have a smaller number. The 25th percentile value is such that 25% of institutions have a smaller number of visitors; the 75th is such that 75% of institutions have a lower number of visitors (i.e. 25% of institutions have a higher number).

Percentile-based distribution patterns for the Asia–Pacific region probably do not accurately portray the spread of expenditures, revenues and visitor or staff numbers for the responding institutions. One response covered 28 science centers in India, providing aggregated answers to all the survey questions. The aggregated values have been divided by 28 and the mean allocated to each of 28 individual science centers. This provides a valid overall mean when combined with all other institutions, or with other institutions in the Asia–Pacific region, but would not give an accurate distribution picture unless the 28 centers were in fact identical in all respects—which is not the case. Distribution patterns for *All respondents* may also be slightly distorted as a result of this treatment of the Indian science centers.

Asia–Pacific results: a caution

The data distribution patterns for the Asia–Pacific region are skewed by the averaging of data from the Indian science centers. Thus we generally report only mean, minimum and maximum values for the data from this region. Where median values are shown, these should be treated with caution.

Values corresponding to the 25th and 75th percentiles are not reported for Latin America & the Caribbean because of the small total number of responses.

While many of the tables and charts offer comparisons among respondent institutions grouped in various ways, we have not explored the statistical significance of any of the differences displayed. This gap in analysis, together with the lack of information on just how representative the respondents are of the industry as a whole, means that too much importance should not be placed on the comparisons.

8.4 About the respondents

Regional distribution of respondents

The regional distribution of respondents is set out above in Table 8-1.

Institution types covered by the survey

Institutions self-classified using six of the 13 categories that feature in the 2004 ASTC survey (the six explicitly science-based ones). The majority of respondents (149, or 75%) classified themselves as 'science center / museum'. Table 8-2 shows the institution types by region. Tables and charts in the rest of this chapter use only two categories—'science centers' and 'other institutions'.

Table 8-2 Respondents by institution type in each region

Type of institution	Number of respondents					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	Southern Africa	TOTAL: all regions
Science center / museum	51	11	37	49	1	149
Aquarium	1	1	1	0	0	3
Arboretum / botanic garden	0	0	1	0	0	1
Natural history museum	8	0	2	1	0	11
Planetarium	1	0	0	1	0	2
Zoo	0	0	1	0	0	1
Other	20	1	8	3	0	32
TOTAL	81	13	50	54	1	199

Dates of opening to the public

Opening or planned opening dates reported by respondents ranged from 1824 to 2008. Table 8-3 shows the number of respondent institutions opening to the public for the first time in each region, by decade since the 1960s.

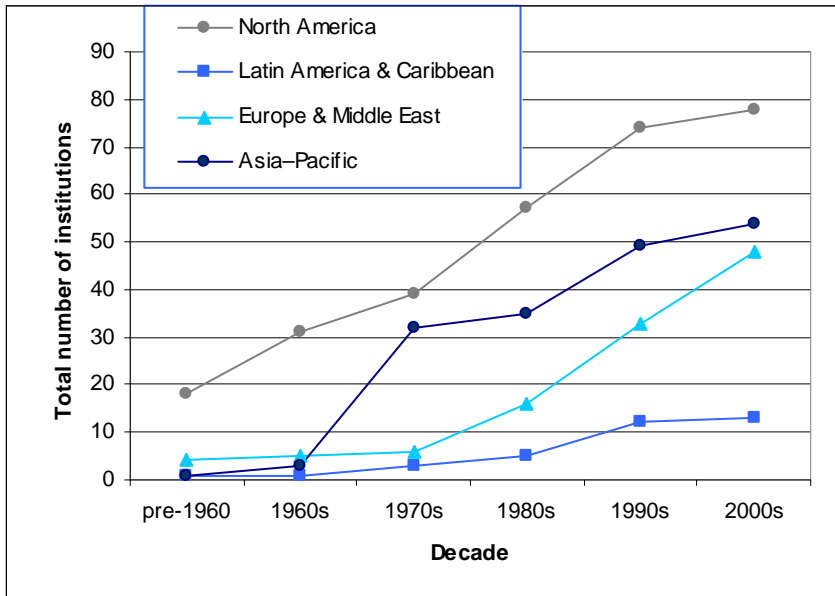
Half of the respondent institutions have opened since 1985, and a quarter since 1994. The growth pattern for each region is shown in Figure 8-1. Given that we are less than halfway through the 2000s decade, it appears that the growth in the number of science centers that started in the 1970s is continuing in all regions.

Table 8-3 Respondents by date of opening in each region

Decade	Number of respondent institutions open to the public for the first time					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region*	Southern Africa	TOTAL: all regions
Before the 1960s	18	1	4	1	0	24
1960s	13	0	1	2	0	16
1970s	9	2	1	29	0	41
1980s	19	2	10	3	1	35
1990s	17	7	17	14	0	55
2000s	4	1	15	5	0	25
TOTAL	80	13	48	54	1	196

* All the science centers making up the National Council of Science Museums in India have been placed in the 1970s, when the Council was formed, even though some opened earlier and some later; individual dates were not provided

Figure 8-1 Growth in the number of science centers and related institutions in each region, to 2004



Sizes of institutions (total interior public space)

Worldwide, respondents reported having over 1.44 million square metres (15.5 million square feet) of interior floor space available for public use. The total interior public space in an individual institution varied from 50 square metres to 150,000 square meters (540 square feet to 1.6 million square feet). The median size, worldwide, was 4,150 square metres (about 44,600 square feet) and the mean size was 7,575 square metres (81,450 square feet).

Table 8-4 shows respondents divided among the four size categories used in the 2004 ASTC member survey. For the 2004 ASTC survey, the choice of these four size categories allowed the responses to fall into four roughly equal groups (i.e. about 25% of respondents fell into each size category). Even for the North American group, respondents to our survey do not fall so neatly into the four categories, with a higher percentage falling into the ‘large’ category. A key reason may be the difference between the relevant questions in the two surveys: ASTC asked for ‘total interior exhibit space’, while our survey asked for the larger quantity ‘total interior public space’ (consistent with earlier ASTC surveys).

Table 8-5 shows a breakdown of respondents in each region by institution type as well as by size.

Small data sets

When respondents are separated into groups according to type or size of institution, some of the resulting groups are very small. Means and distribution patterns for these small groups are unlikely to be representative of the wider population of institutions in these groups. In particular, we do not report detailed information for the following groups (each containing only one or two institutions) in many of the tables, although their data are included in the calculations for ‘all regions’:

1. Latin America & the Caribbean: large institutions
2. Asia-Pacific region: small institutions
3. Latin America & the Caribbean: other institutions (i.e. not science centers / museums).

Table 8-4 Respondents by size (total interior public space) in each region

Interior public space	Number of respondents (and percentage within region)					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	Southern Africa	TOTAL: all regions
Very small 1,115 m ² or less (12,000 ft ² or less)	16 (21%)	5 (39%)	13 (27%)	4 (8%)	0	38 (20%)
Small 1,116–2,325 m ² (12,001–25,000 ft ²)	17 (23%)	6 (46%)	4 (8%)	1 (2%)	1	29 (15%)
Medium 2,326–4,650 m ² (25,001–50,000 ft ²)	14 (19%)	0	11 (23%)	6 (11%)	0	31 (16%)
Large More than 4,650 m ² (>50,000 ft ²)	28 (37%)	2 (15%)	20 (42%)	42 (79%)	0	92 (48%)
Total interior public space in square metres						
Mean size	7,508	3,038	7,914	8,589		7,575
Minimum size	93	100	50	160		50
25 th percentile	1,212		1,000			1,491
Median size	2,750	1500	3,250			4,150
75 th percentile	6,338		6,676			6,205
Maximum size	150,000	21,000	150,000	97,683		150,000
Sum	563,101	39,491	379,858	455,225		1,439,175
Number of respondents	75	13	48	53	1	190

Size distributions for respondents in North America were comparable to those in Europe & the Middle East, with respondents in Latin America & the Caribbean reporting smaller mean, median and maximum sizes—although this could be an artefact of the smaller sample size. The mean institution size, based on total interior public space, was greatest in the Asia-Pacific region.

Table 8-5 Respondents by size (total interior public space) and by institution type in each region

Category	Number of respondents					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	Southern Africa	All regions
Science centers*						
Very small	7	3	10	4		24
Small	11	6	3	1	1	22
Medium	8		8	4		20
Large	21	2	16	39		78
TOTAL	47	11	37	48	1	144
Other institution types						
Very small	9	2	3	0		14
Small	6		1	0		7
Medium	6		3	2		11
Large	7		4	3		14
TOTAL	28	2	11	5	0	46

Provision of outdoor space

Overall, nearly half (91 institutions, or 47%) of all respondents reported having some outdoor space for public use, with the amount of outdoor space ranging from less than 100 square metres (1,075 square feet) to nearly 180,000 square metres (over 1.9 million square feet). However, there were regional differences in the extent of provision of outdoor space. While 25% of North American and 35% of Europe & the Middle East respondents had outdoor space, the proportions were considerably higher in the other regions: 80% of Asia-Pacific region respondents and 85% of Latin America & the Caribbean respondents had outdoor space available for public use.

8.5 Financial information

Overview of revenue and expenditure patterns

All financial data are reported in US dollars. In the small number of cases where information was provided in other currencies, we carried out the conversion when the relevant survey response was received (mid-2004).

Based on operating expenditure data provided by 191 institutions in our survey, more than \$1,100 million was spent worldwide by respondent institutions in one year. The mean annual expenditure was \$5.81 million and the median expenditure was \$1.75 million.

Only 169 institutions provided revenue data: together they reported total revenue of \$1,010 million. The mean revenue for one year was \$5.96 million; the median value was \$1.74 million.

Figure 8-2 and Figure 8-3 are based on data from the 166 respondents who provided information about both total revenue and total operating expenditure. Figure 8-2 shows the total revenue and expenditure amounts for each region and for all regions taken together, while Figure 8-3 shows mean and median values.

Figure 8-2 Total revenue and total operating expenditure in each region

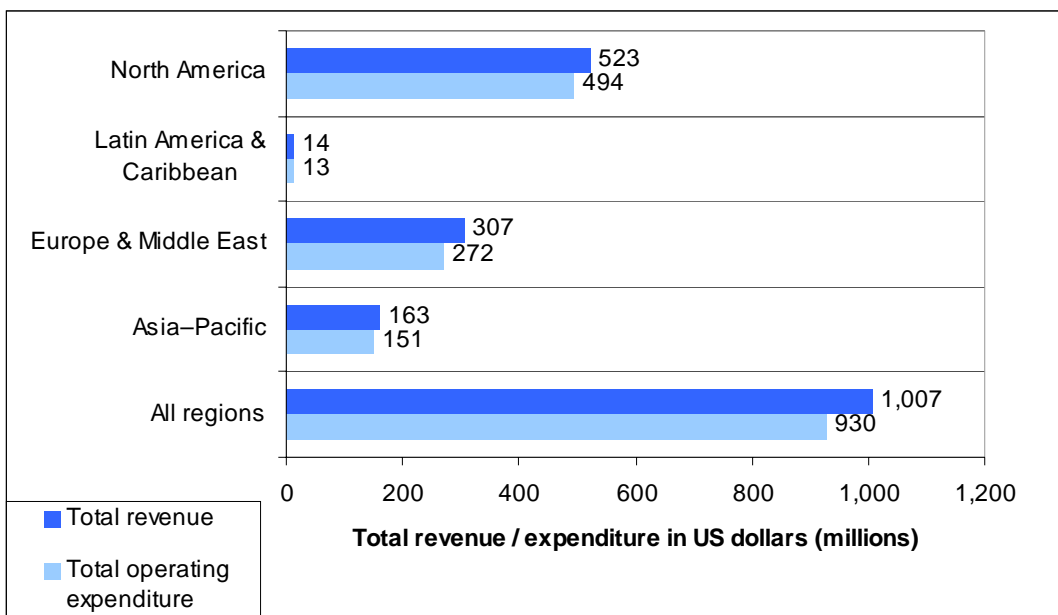
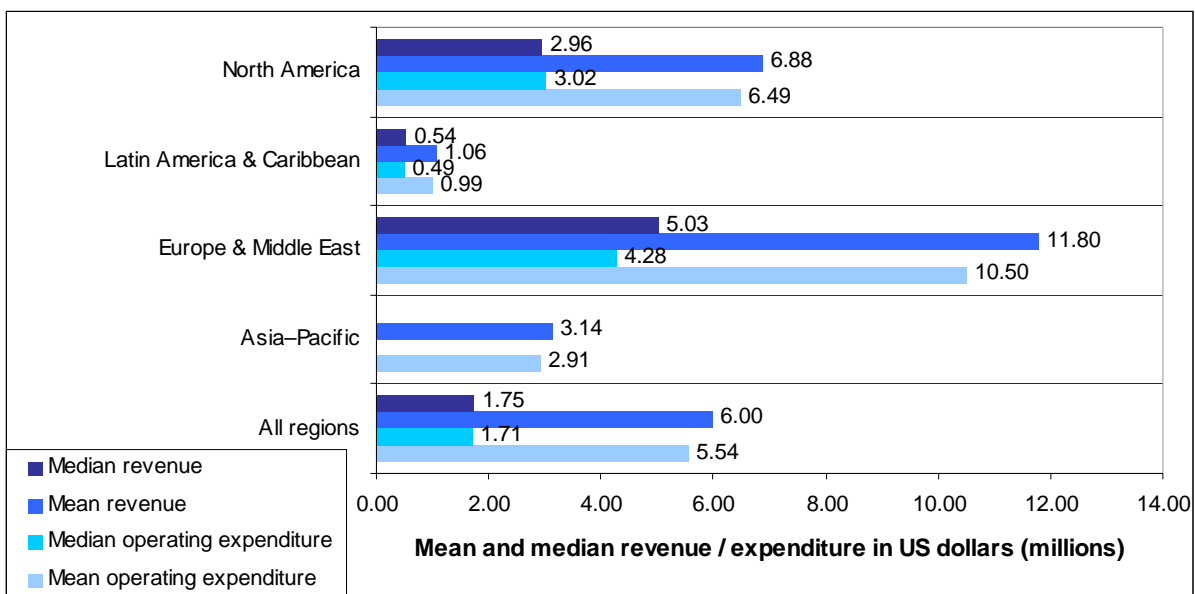


Figure 8-3 Mean and median revenue and operating expenditure in each region



Most respondents reported positive or break-even financial outcomes: 61% reported an excess of revenue over expenditure, and another 13% reported expenditure equal to revenue. Worldwide, the mean margin of revenue over expenditure was nearly \$461,000; the median value was a little over \$80,000. Table 8-6 shows the percentages of institutions in each region that reported an excess of revenue over expenditure, and mean and median values for the net excess in each region. The analysis is based on data from the 166 institutions for which we have both total revenue and total expenditure amounts.

Table 8-6 Revenue–expenditure analysis for each region

	North America	Latin America & Caribbean	Europe & Middle East	Asia–Pacific region	Southern Africa	All regions
Mean operating excess (US\$)	381,909	69,222	1,365,329	229,846		460,908
Median operating excess (US\$)	14,561	0	0			80,269
Percentage showing excess	54%	46%	42%	83%	100%	61%
Percentage with zero excess	14%	8%	27%	4%		13%
Percentage showing negative 'excess'	32%	46%	31%	13%		27%
Number of respondents	76	13	26	52	1	168

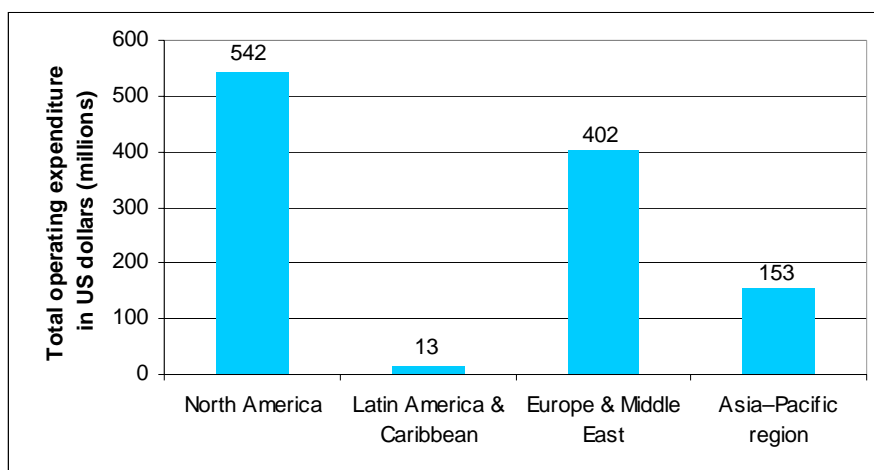
Admission fees

A large majority, 174 out of 195 respondents (89%), charged an admission fee. More than half (12 out of 21) of the non-charging respondents were in the United States; three were in the United Kingdom, four in different countries in Latin America & the Caribbean and one each in France and New Zealand.

Total operating expenditure

The total amount spent annually by 191 institutions responding to this survey was over \$1,100 million, with nearly half (49%) of this in North America and a further 36% in Europe & the Middle East. Mean and median operating expenditures were highest in Europe & the Middle East and considerably lower in the Asia–Pacific region and in Latin America & the Caribbean. Figure 8-4 shows the total operating expenditure in each region, based on these 191 respondents.

Figure 8-4 Total operating expenditure for all respondents in each region



For comparability with ASTC data, institutions participating in this project have been grouped according to their operating expenditure. Table 8-7 show this breakdown for all respondents, and for respondents within each region.

The distribution of respondents among the four expenditure categories was fairly even for the North American group. This is not surprising, as the categories were selected on the basis of responses to the 2004 ASTC member survey (ASTC 2004a), for which 87% of respondents were in North America. Other regional networks might find different expenditure categories more useful for internal analysis.

Table 8-7 Respondents in each region, by four 'total operating expenditure' categories

Operating expenses (US\$)	Number of respondents in expenditure category (and percentage within region)					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	Southern Africa	TOTAL: all regions
Under \$1 million	19 (24%)	9 (69%)	12 (26%)	34 (64%)	1	75 (39%)
\$1 million–\$2.5 million	18 (23%)	2 (15%)	7 (15%)	6 (11%)		33 (17%)
\$2.5 million–\$6.5 million	19 (24%)	2 (15%)	17 (37%)	4 (8%)		42 (22%)
\$6.5 million and above	22 (28%)	0	10 (22%)	9 (17%)		41 (21%)

Table 8-8 shows the total operating expenditure for respondent institutions in each region, by institution type and by institution size.

Table 8-8 Total operating expenditure by institution type and institution size in each region

Category	Total operating expenditure in US dollars				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents*					
Mean	6,945,008	988,684	8,728,011	2,894,351	5,809,464
Minimum	7,460	15,000	73,200	170,000	7,460
25th percentile	1,011,831		950,228		328,050
Median	3,021,040	494,575	3,682,100		1,753,000
75th percentile	8,121,348		5,873,438		5,775,903
Maximum	46,000,000	3,800,000	124,271,000	26,006,141	124,271,000
Sum	541,710,591	12,852,898	401,488,500	153,400,579	1,109,607,568
Number of respondents	78	13	46	53	191
Science centers*					
Mean	7,158,092	1,158,482	7,792,520	2,327,686	5,208,759
Minimum	7,460	77,000	73,200	170,000	7,460
Median	3,293,481	609,441	3,704,200		1,553,624
Maximum	32,355,000	3,800,000	124,271,000	26,006,141	124,271,000
Sum	357,904,620	12,743,298	272,738,197	111,728,913	755,270,028
Number of respondents	50	11	35	48	145
Other institution types					
Mean	6,564,499		11,704,573	8,334,333	7,702,990
Minimum	70,000		311,100	350,714	15,000
Median	2,831,613		2,745,000		2,708,073
Maximum	46,000,000		78,324,000	21,559,000	78,324,000
Sum	183,805,971		128,750,303	41,671,666	354,337,540
Number of respondents	28	2	11	5	46
Very small institutions					
Mean	1,055,998	122,720	1,099,856	773,003	913,510
Minimum	7,460	15,000	73,200	211,923	7,460
Median	951,895	94,600	825,413		750,000
Maximum	2,992,079	310,000	4,941,000	1,325,090	4,941,000
Sum	16,895,971	613,600	13,198,275	3,092,013	33,799,859
Number of respondents	16	5	12	4	37
Small institutions*					
Mean	999,281	1,119,389	2,619,400		1,686,767
Minimum	117,300	490,000	671,610		155,000
Median	1,562,712	629,721	2,157,994		1,245,636
Maximum	5,869,806	3,217,525	5,490,000		5,869,806
Sum	29,710,544	6,716,332	10,477,598		47,229,474
Number of respondents	16	6	4	1	28
Medium institutions					
Mean	3,586,381		3,840,987	2,184,408	3,405,375
Minimum	750,000		750,060	223,574	223,574
Median	2,212,073		2,846,000		2,745,000
Maximum	11,470,510		10,629,000	4,277,000	11,470,510
Sum	50,209,330		42,250,855	13,106,447	105,566,632
Number of respondents	14		11	6	31
Large institutions					
Mean	15,139,897		17,661,146	3,295,143	10,001,141
Minimum	149,888		915,000	170,357	149,888
Median	13,959,987		6,405,000		4,830,562
Maximum	46,000,000		124,271,000	26,006,141	124,271,000
Sum	423,917,128		335,561,772	135,100,851	900,102,717
Number of respondents	28	2	19	41	90

* 'All regions' values include the single South African respondent.

Direct comparisons of expenditure amounts in different regions have limited meaning, because of the different economic circumstances in the regions concerned. A very simplistic 'levelling' can be done by considering the gross domestic product (GDP) per capita for the countries covered by the survey. Table 8-9 shows the range of GDP per capita values for the countries in each region that are represented in the survey, and also the median value for each region (based on merely listing the GDP values for each country in the region, without any adjustments for different populations).

Table 8-9 GDP per capita for regions covered by the survey

GDP per capita (US\$)	GDP per capita for each region in US dollars					
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	Southern Africa	All regions
Lowest value in region	29,700	4,800	18,000	2,900		2,900
Highest value in region	37,800	11,200	32,800	28,900		37,800
Median value in region	33,750	8,300	27,550	17,700	10,700*	19,700**
Median operating expenses ÷ median GDP per capita for region	90	60	134	10		89

* GDP per capita for South Africa

** Median GDP per capita for the countries represented in the survey; GDP per capita for world as a whole is \$8,200.

Note: GDP per capita values are from <http://www.worldfactsandfigures.com/gdp_country_desc.php>; they are derived from purchasing power parity (PPP) calculations rather than from conversions at official currency exchange rates, and most are 2003 estimates.

The last row in Table 8-9 indicates that not only do median expenditures in their own right vary across the regions as shown in Table 8-8, but so do median expenditures in relation to GDP per capita. While it is beyond the scope of this study, more rigorous analysis of science center spending in relation to the economy of a country or a group of countries might lead to meaningful comparisons between geographical regions or individual countries.

Salaries and other staff-related expenditure

Respondents were asked to indicate their total expenditure on all staff-related items, including salaries and wages, overtime, bonuses, employer's superannuation and insurance contributions, occupational pensions and any other relevant expenses. Worldwide, respondent institutions spent nearly \$445 million on these items; 57% of this expenditure was in North America and 27% in Europe & the Middle East. The mean value for staff-related expenditure per institution was nearly \$2.73 million and the median value was \$852,000.

Figure 8-5 shows the mean and median values of staff-related expenditure for institutions in each region.

Figure 8-5 Mean and median values of staff-related expenditure in each region

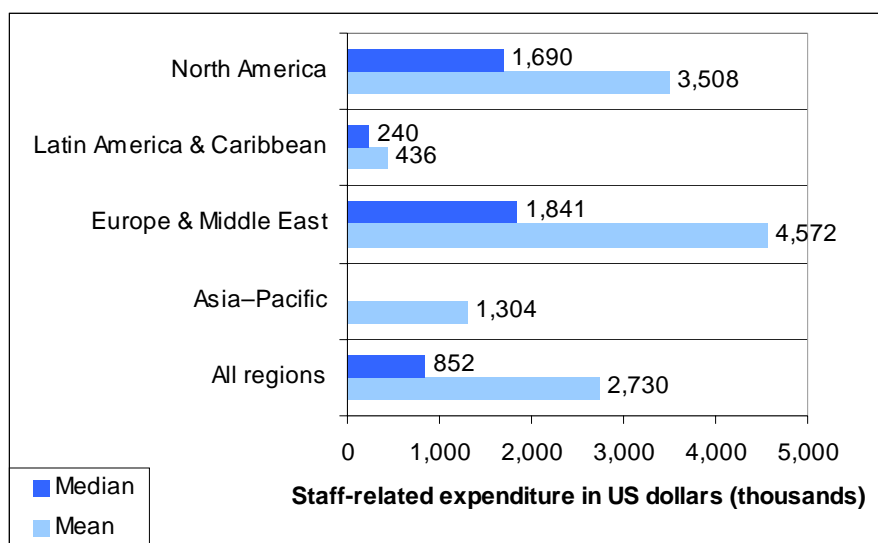


Table 8-10 shows staff-related expenditure amounts for institutions in each region, with breakdowns by institution type and institution size.

Table 8-10 Staff-related expenditure in each region, by institution type and by institution size

Category	Total staff-related expenditure in US dollars				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents*					
Mean	3,508,474	435,909	4,572,234	1,303,931	2,729,812
Minimum	4,500	12,000	373,900	95,567	4,500
25th percentile	589,308		1,006,344		131,139
Median	1,689,790	240,000	1,840,520		852,000
75th percentile	3,873,731		3,150,697		2,706,134
Maximum	17,735,000	1,205,600	58,072,000	12,377,719	58,072,000
Sum	252,610,100	5,666,822	118,878,086	67,804,409	444,959,417
Number of respondents	72	13	26	52	164
Science centers*					
Mean	3,837,576	506,847	4,650,567	988,683	2,634,478
Minimum	4,500	62,000	373,900	95,567	4,500
Median	1,806,000	266,365	1,943,020		774,590
Maximum	17,735,000	1,205,600	58,072,000	12,377,719	58,072,000
Sum	188,041,242	5,575,322	102,312,473	46,468,091	342,482,128
Number of respondents	49	11	22	47	130
Other institution types					
Mean	2,807,342		4,141,403	4,267,264	3,016,538
Minimum	66,000		1,043,613	127,383	12,000
Median	1,509,006				1,518,003
Maximum	15,293,000		12,000,000	10,620,355	15,293,000
Sum	64,568,858		16,565,613	21,336,318	102,562,289
Number of respondents	23	2	4	5	34
Very small institutions					
Mean	620,079	85,100	870,067	362,827	506,466
Minimum	4,500	12,000		115,999	4,500
Median	531,617				421,104
Maximum	1,573,579	195,000		490,000	1,573,579
Sum	8,681,104	425,500	2,610,200	1,451,307	13,168,111
Number of respondents	14	5	3	4	26
Small institutions*					
Mean	999,281	562,754			842,616
Minimum	117,300	134,894			85,000
Median	738,876	358,183			668,796
Maximum	2,727,100	1,205,600			2,727,100
Sum	15,988,500	3,376,524			21,908,024
Number of respondents	16	6	2	1	26
Medium institutions					
Mean	1,848,293		1,791,218	1,190,344	1,685,171
Minimum	352,244		496,658	95,567	95,567
Median	1,166,000		1,221,807		1,166,000
Maximum	5,641,378		3,845,200	2,146,000	5,641,378
Sum	24,027,810		14,329,746	7,142,062	45,499,618
Number of respondents	13	0	8	6	27
Large institutions					
Mean	7,469,205		7,660,011	1,441,733	4,326,284
Minimum	70,584		373,900	103,929	70,584
Median	7,071,977		2,712,268		1,932,699
Maximum	17,735,000		58,072,000	12,377,719	58,072,000
Sum	194,199,333		99,580,140	59,111,040	354,755,311
Number of respondents	26	2	13	41	82

* 'All regions' values include the single South African respondent.

In North America and Europe & the Middle East, both mean and median values for staff expenditure by science centers were slightly higher than the corresponding values for other types of institutions. In the Asia-Pacific region, the values for 'other institutions' were strongly influenced by the fact that three of the five non-science-center respondents were large national museums, with large numbers of staff and thus large staff-related expenses.

Figure 8-6 shows the mean and median values of staff-related expenditure in each region, separated according to institution type, and Figure 8-7 shows a breakdown by institution size.

Figure 8-6 Staff-related expenditure by institution type in each region (mean and median values)

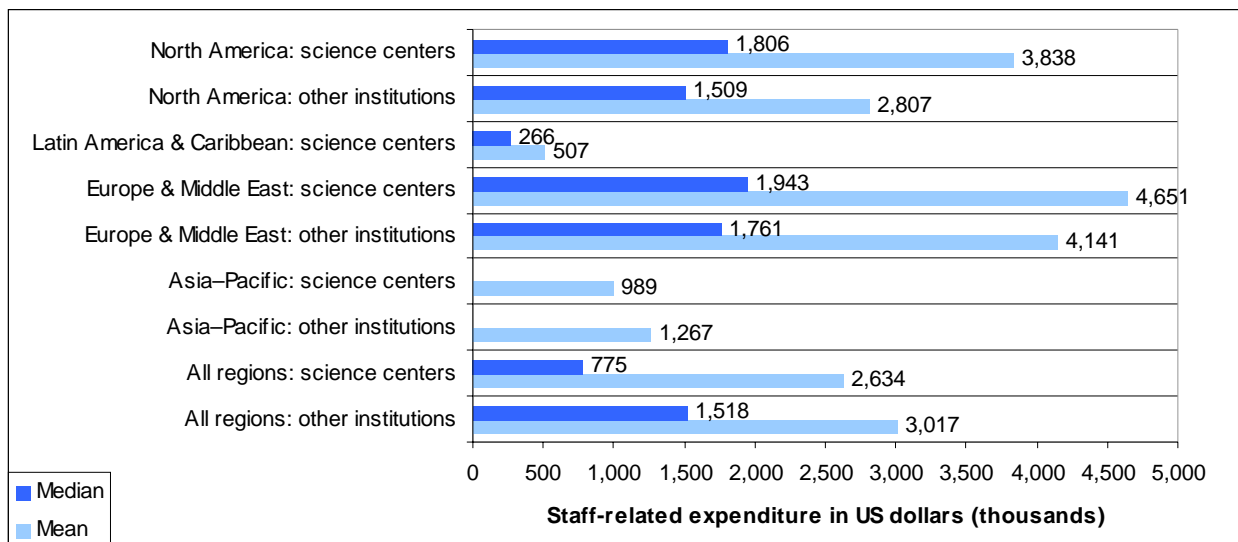
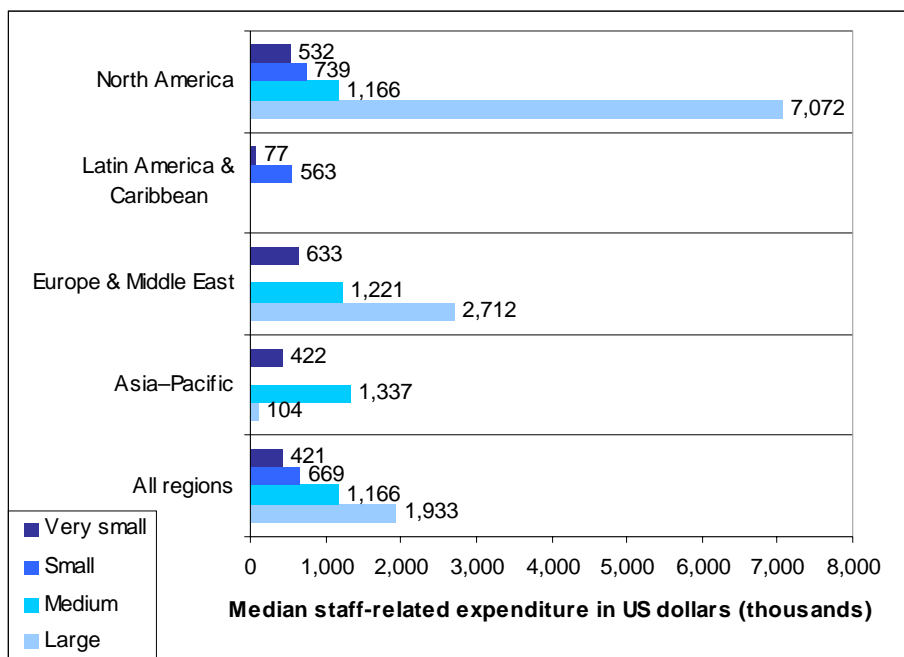


Figure 8-7 Median staff-related expenditure by institution size in each region



Worldwide, staff-related expenditure made up 54% of total operational expenditure. This pattern was reflected in three of the individual regions—North America, Latin America & the Caribbean and the Asia-Pacific region—where over 50% of total expenditure was used for staff-related costs. In Europe & the Middle East, however, staff-related expenditure was less than 50% of total operational expenditure. Figure 8-8 shows mean and median values of the percentage that staff-related expenditure contributed to total operational expenditure in each region.

Figure 8-8 Staff-related expenditure as a percentage of total operational expenditure

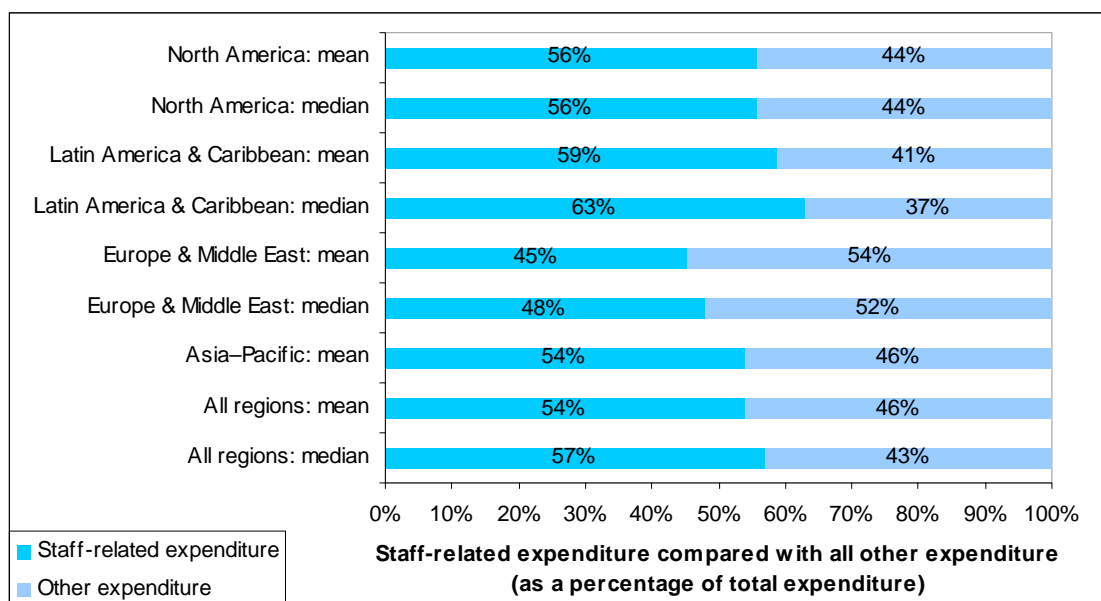


Table 8-11 shows the per-employee costs for all respondents in each region, i.e. the total staff-related costs divided by the number of full-time equivalent employees. (The ‘Employees and volunteers’ section later in this chapter explains the full-time equivalent concept.)

Table 8-11 Staff-related costs per full-time equivalent employee in each region

Category	Staff-related costs per full-time equivalent employee, in US dollars				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents					
Mean	37,713	10,354	30,391	12,223	26,991
Minimum	13,600	3,027	6,924	3,849	3,027
25th percentile	30,170	4,750	25,000		6,927
Median	36,719	6,522	30,100		30,000
75th percentile	46,869	13,072	34,375		37,872
Maximum	63,561	30,000	78,824	63,993	78,824
Number of respondents	69	8	17	45	139

Total revenue

For 169 survey respondents worldwide, the total revenue reported for one year was slightly over \$1,000 million. Institutions in North America accounted for 52% of this income, those in Europe & the Middle East for 30%, those in the Asia-Pacific region for 16% and those in Latin America & the Caribbean for 1.4%.

Table 8-12 shows revenue patterns in detail: total revenue for all respondents by region, grouped by institution type and by institution size. A few respondents commented that their figure for total annual revenue might be inaccurate, because their institutions report some of their revenue against projects rather than by year of receipt. In these cases, the estimate provided by the respondent was used for the aggregated data, despite the qualifying comments.

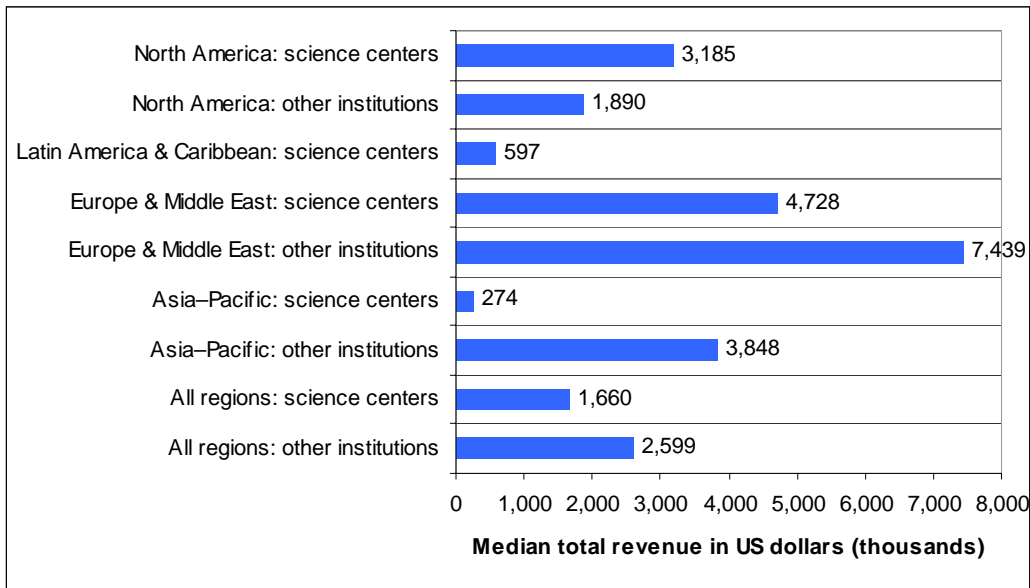
Table 8-12 Total revenue by institution type and institution size in each region

Category	Total revenue in US dollars				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents*					
Mean	6,795,556	1,057,906	11,823,457	3,142,717	5,964,815
Minimum	7,600	7,500	903,899	170,000	7,500
25 th percentile	1,023,317		2,347,500		319,780
Median	2,898,296	537,221	5,029,077		1,741,964
75 th percentile	7,945,629		8,594,956		5,728,000
Maximum	42,775,000	4,800,000	144,642,000	28,676,169	144,642,000
Sum	523,257,805	13,752,782	307,409,877	163,421,289	1,008,053,753
Number of respondents	77	13	26	52	169
Science centers*					
Mean	7,533,642	1,248,198	11,530,104	243,109	5,780,402
Minimum	7,600	15,000	903,899	170,000	7,600
Median	3,184,945	596,838	4,724,077		1,660,048
Maximum	30,395,000	4,800,000	144,642,000	28,676,169	144,642,000
Sum	378,682,077	13,730,182	253,662,290	112,946,140	757,232,689
Number of respondents	50	11	22	47	131
Other institution types					
Mean	5,428,731		13,436,897	10,095,030	6,600,554
Minimum	67,000		2,370,000	325,190	7,500
Median	1,890,000				2,599,403
Maximum	30,395,000		36,500,000	22,718,000	42,775,000
Sum	146,575,728		53,747,587	50,475,149	250,821,064
Number of respondents	27	2	4	5	38
Very small institutions					
Mean	1,008,749	86,920	1,460,350	861,899	866,462
Minimum	7,600	7,500		211,923	7,500
Median	1,009,889				711,216
Maximum	3,032,232	350,000		1,816,674	3,032,232
Sum	15,131,231	434,600	4,381,050	3,447,597	23,394,478
Number of respondents	15	5	3	4	27
Small institutions*					
Mean	1,791,326	1,104,803	2,146,752		1,546,550
Minimum	226,5008	511,600			170,000
Median	1,551,070	623,419			1,232,975
Maximum	5,630,071	2,754,500			5,630,071
Sum	30,452,536	6,628,817	4,293,503		41,756,856
Number of respondents	17	6	2	1	27
Medium institutions					
Mean	3,626,779		4,354,308	2,406,046	3,573,059
Minimum	917,000		903,899	172,119	173,119
Median	1,801,308		3,973,000		2,442,595
Maximum	11,474,073		9,879,700	4,450,000	11,474,073
Sum	50,774,900		34,834,467	14,436,273	100,045,640
Number of respondents	14	0	8	6	28
Large institutions					
Mean	14,980,507		20,300,066	3,545,547	9,884,715
Minimum	137,316		2,858,180	273,929	137,316
Median	14,516,000		8,392,325		4,596,942
Maximum	42,775,000		144,642,000	28,676,169	144,642,000
Sum	404,473,691		263,900,857	145,367,419	820,431,332
Number of respondents	27	2	13	41	83

* 'All regions' values include the single South African respondent.

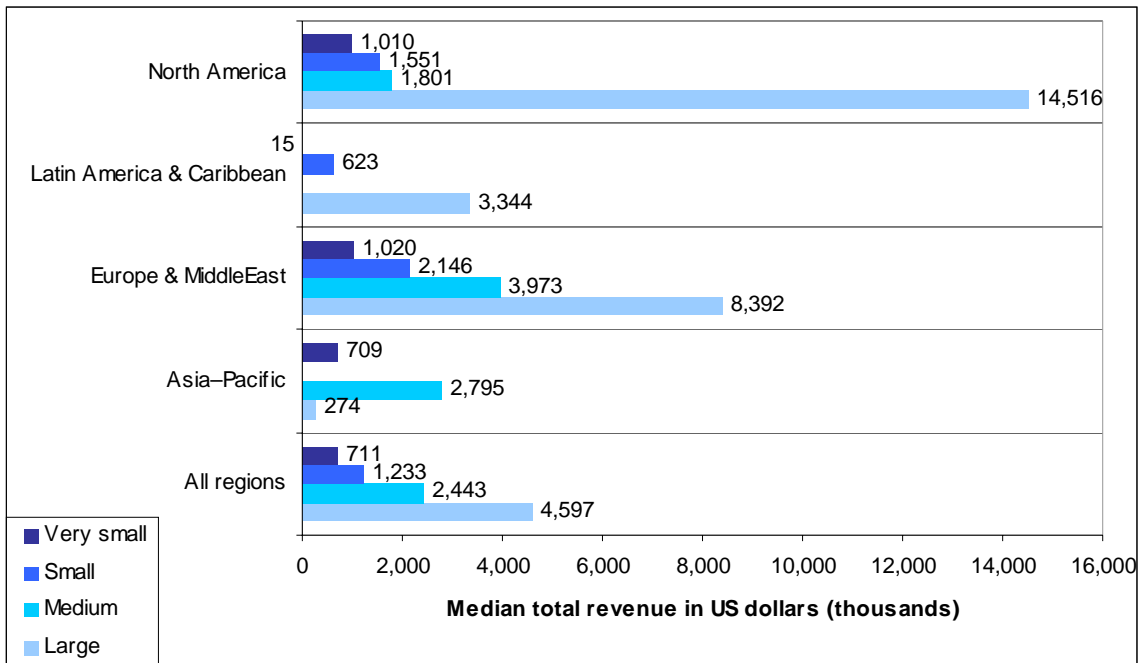
Figure 8-9 shows the median total revenue for each region, by institution type. In North America, Europe & the Middle East, and in all regions taken together, mean revenues for science centers were of a similar order of magnitude to those for other institution types covered by the survey. In the Asia-Pacific region several respondents in the 'other institutions' category were large national museums with correspondingly large budgets.

Figure 8-9 Median total revenue by institution type in each region



As might be expected, larger institutions had larger revenues, but the difference between 'large' institutions and those in the other three size categories with respect to median revenue amounts was more pronounced among North American respondents than among those in other regions. This is shown in Figure 8-10.

Figure 8-10 Median total revenue by institution size in each region



Sources of revenue

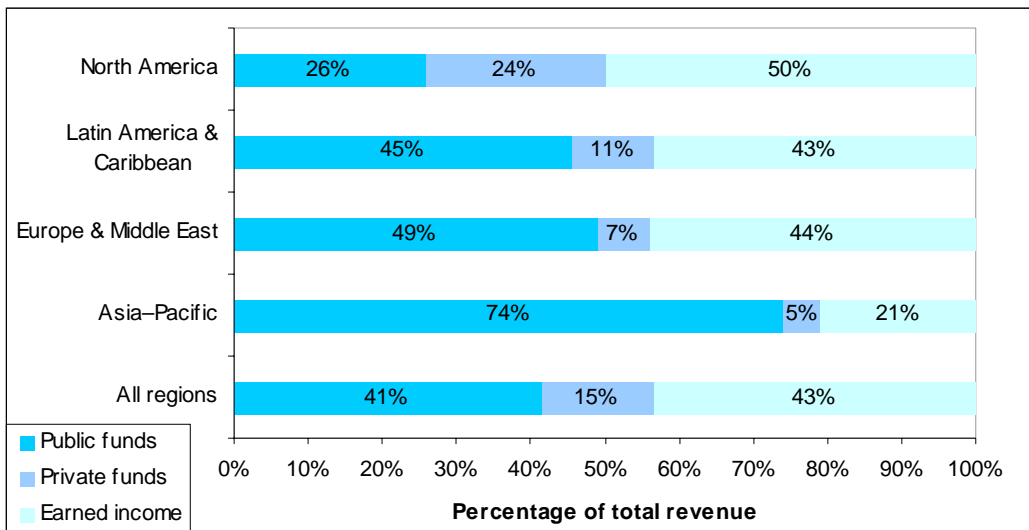
Respondents were asked to indicate not only their total revenue but also the breakdown of this revenue by source:

- public funding: funds from local, state and national government sources
- private funding: e.g. gifts, donations, sponsorship
- earned income: income from admission fees, educational events and fees, subscriptions and membership, retail sales (e.g. café, shop), other trading activities, interest and other investment income.

The ASTC survey also used the category 'endowment income'; where this was reported separately in our survey, it has been included with earned income.

Worldwide, earned income made up 43% of total revenue received by respondent institutions, public funding provided 41%, and private funding sources supplied 15%. North America and the Asia-Pacific region varied most from this pattern. In North America, science centers received a larger proportion of their revenue as earned income (50%) and received more private funding (24%) than centers in other regions. In the Asia-Pacific region, public funding made up a much higher proportion (74%) of total revenue, and private funding (5%) played a smaller role. Figure 8-11 shows the distribution of revenue sources for respondent institutions in each region.

Figure 8-11 Revenue sources for all respondents in each region



A more detailed picture of revenue sources is shown in Table 8-13, which shows amounts and percentages of revenue received from the three sources, for institutions in each region, broken down by institution type and size.

Table 8-13 Sources of revenue by institution type and institution size in each region

Category and revenue source	Mean revenue in US dollars (and percentage of total revenue)				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents*					
Public funds	1,729,932 (26%)	479,358 (45%)	5,789,731 (49%)	2,318,323 (74%)	2,438,008 (41%)
Private funds	1,608,896 (24%)	118,916 (11%)	860,907 (7%)	153,508 (5%)	914,157 (15%)
Earned revenue	3,406,059 (50%)	455,785 (43%)	5,173,056 (44%)	670,700 (21%)	2,579,626 (43%)
Total revenue	6,744,888	1,054,060	11,823,694	3,142,531	5,931,791
Number of respondents	75	13	26	52	167
Science centers*					
Public funds	2,174,885 (28%)	564,505 (45%)	6,227,591 (54%)	1,871,105 (78%)	2,598,560 (45%)
Private funds	1,735,028 (23%)	140,537 (11%)	921,713 (8%)	102,507 (4%)	859,560 (15%)
Earned revenue	3,771,542 (49%)	538,610 (43%)	4,381,081 (38%)	429,292 (18%)	2,364,098 (41%)
Total revenue	7,681,455	1,243,653	11,530,385	2,402,904	5,822,219
Number of respondents	49	11	22	47	130
Other institution types					
Public funds	891,366 (18%)		3,381,505 (25%)	6,522,178 (65%)	1,873,906 (30%)
Private funds	1,371,187 (28%)		526,475 (4%)	632,914 (6%)	1,105,982 (18%)
Earned revenue	2,717,266 (55%)		9,528,917 (71%)	2,939,938 (29%)	3,336,885 (53%)
Total revenue	5,428,731		13,436,897	10,095,030	6,316,554
Number of respondents	26	2	4	5	37
Very small institutions					
Public funds	297,420 (29%)	63,820 (73%)	323,133 (22%)	169,153 (20%)	235,730 (27%)
Private funds	287,578 (28%)	400	236,567 (16%)	203,451 (24%)	213,523 (24%)
Earned revenue	453,212 (44%)	22,700 (26%)	900,650 (62%)	486,796 (57%)	427,215 (49%)
Total revenue	1,038,210	86,920	1,460,350	859,399	876,469
Number of respondents	14	5	3	4	26
Small institutions*					
Public funds	442,623 (25%)	447,896 (41%)			401,100 (26%)
Private funds	466,931 (26%)	176,561 (16%)			436,930 (28%)
Earned revenue	881,772 (49%)	472,012 (43%)			706,668 (46%)
Total revenue	1,791,326	1,096,470			1,544,698
Number of respondents	17	6	2	1	27
Medium institutions					
Public funds	1,078,209 (30%)		1,918,384 (44%)	1,622,312 (67%)	1,439,352 (40%)
Private funds	1,125,293 (31%)		460,900 (11%)	155,498 (6%)	727,653 (20%)
Earned revenue	1,414,277 (39%)		1,975,025 (45%)	628,236 (26%)	1,406,053 (39%)
Total revenue	3,626,779		4,345,308	2,406,046	3,573,059
Number of respondents	14	0	8	6	28
Large institutions					
Public funds	3,900,778 (26%)		10,287,215 (51%)	2,685,179 (76%)	4,249,653 (43%)
Private funds	3,442,671 (23%)		1,179,366 (6%)	150,625 (4%)	1,359,773 (14%)
Earned revenue	7,567,272 (51%)		8,833,960 (44%)	709,751 (20%)	4,191,097 (43%)
Total revenue	14,980,507		20,300,066	3,545,555	9,800,523
Number of respondents	26	2	13	41	82

* 'All regions' values include the single South African respondent.

Note: Some of the amounts in this table vary slightly from corresponding amounts in Table 8-8, because two institutions provided only total revenue amounts, without a breakdown by revenue source. These institutions are included in Table 8-8 but not in this table. Also, four institutions that provided a breakdown of revenue by source did not provide a floor area, so are included in this table in the 'institution type' section but not in the 'institution size' section.

Worldwide, and in each region, science centers received a slightly higher percentage of their total revenue from public funding sources than did other institutions. The 'other' institutions had a higher proportion of earned income, with the percentage of private support being sometimes greater and sometimes less for science centers compared with other institutions in the same region. Figure 8-12 shows the breakdown among funding sources for institutions in each region, by institution type.

Figure 8-12 Revenue sources by institution type in each region

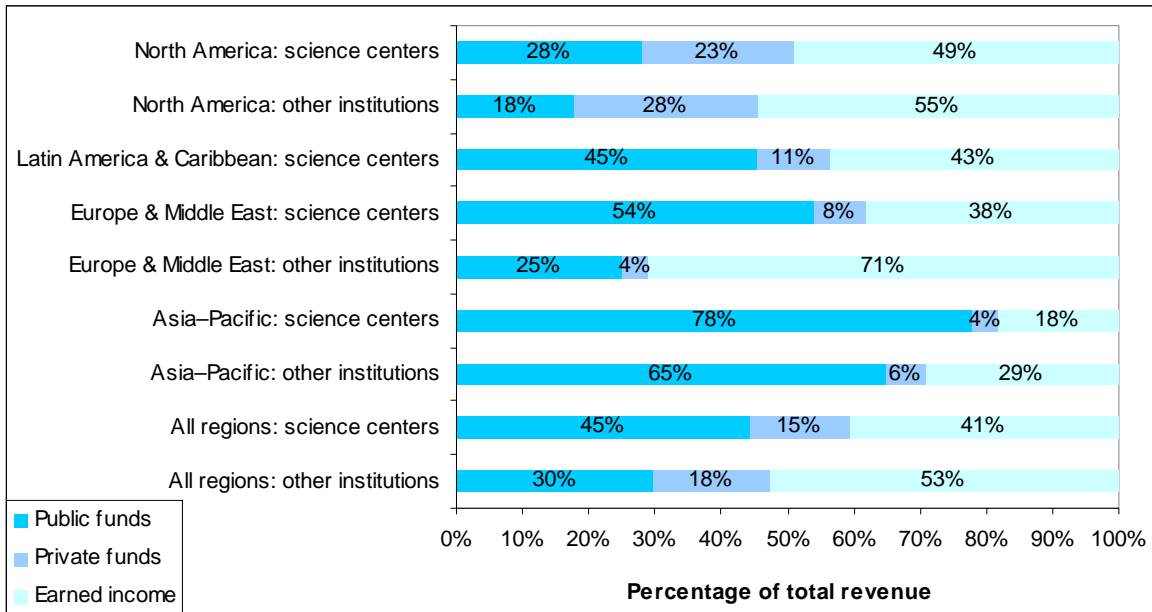
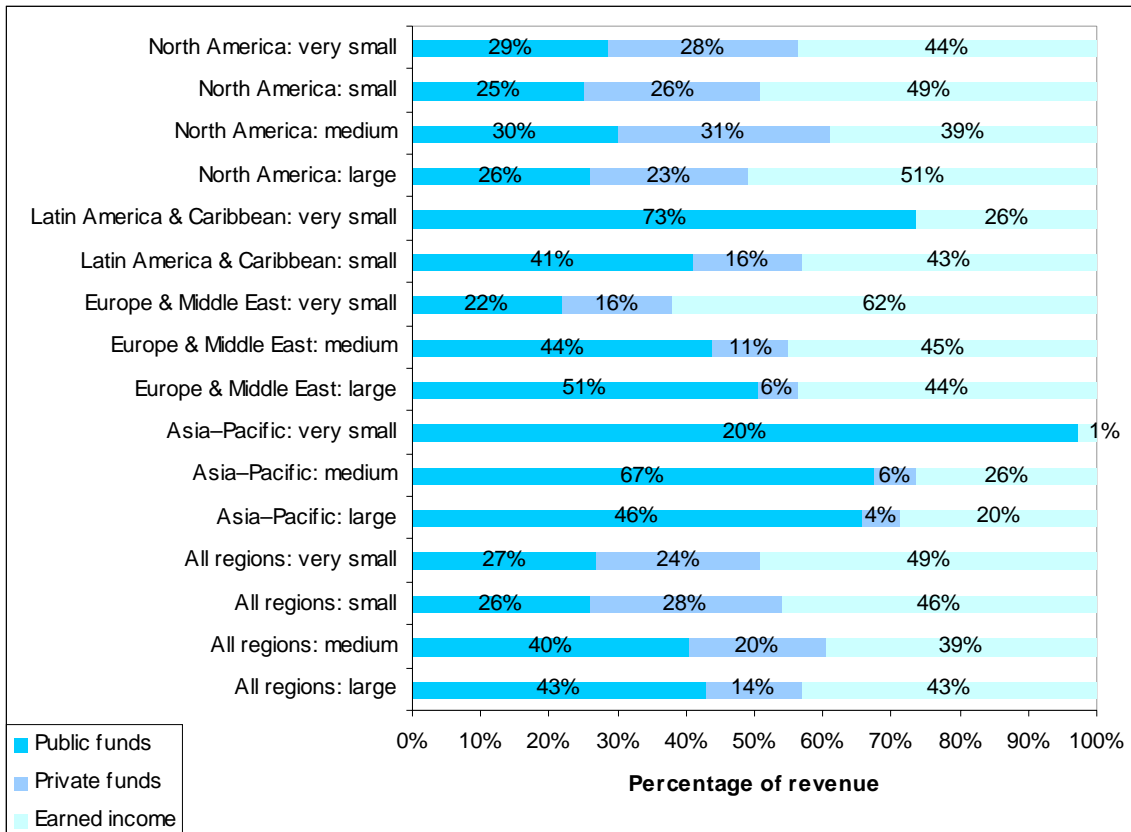


Figure 8-13 shows the pattern of funding sources for institutions of different sizes in each region. Worldwide, medium and large institutions received a higher proportion of total revenue from public funding sources (around 40%) than small and very small science centers (just over 25%). On a regional basis, this pattern was echoed in Europe & the Middle East, where the difference between smaller and larger centers was even more marked, but in North America there was little difference: science centers of all sizes received 25–30% of their funding from public sources. The patterns for Latin America & the Caribbean and the Asia-Pacific region are harder to interpret with any confidence: the sample sizes for Latin America were very small; and the averaging of data for the 28 science centers in India means that the division into size-based groups for the region as a whole may not be valid.

Figure 8-13 Revenue sources by institution size in each region



Capital expenditure

Worldwide, 128 respondents reported a total capital expenditure (for buildings, exhibitions and other fixed assets) of over \$308 million. Figure 8-14 shows the total capital expenditure reported by institutions in each region. The costs of initial building and setting up one large new center in the Asia-Pacific region have been excluded in an attempt to reflect a more 'typical' annual capital expenditure pattern, although we recognise that this expenditure would have made a significant contribution to the local economy.

Figure 8-14 Total capital expenditure in each region

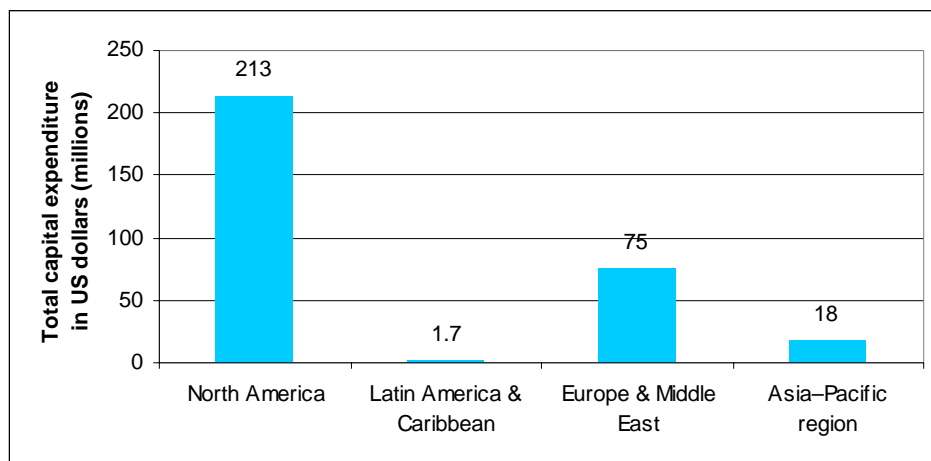


Table 8-14 shows the pattern of capital expenditure reported by respondents, by region.

Table 8-14 Capital expenditure by region

Category	Total capital expenditure in US dollars				All regions*
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	
All respondents					
Mean	3,871,187	188,318	4,181,931	406,044	2,407,788
Minimum	300	11,700	89,950	18,000	300
25th percentile	112,271		260,355		93,571
Median	500,000	70,000	698,767		221,989
75th percentile	2,583,500		3,119,533		1,300,000
Maximum	49,306,530	1,000,000	38,148,634	3,153,661	49,306,530
Sum	212,915,262	1,694,862	75,274,754	18,271,965	308,196,843
Number of respondents	55	9	18	45	128

* 'All regions' values include the single South African respondent.

8.6 Visitor numbers

Worldwide, 193 institutions reported total attendances of nearly 77 million, with the mean number of visits being nearly 400,000 and the median value being nearly 260,000. Of these visits, 61.8 million were on-site, with numbers of on-site visits ranging from 227 for an outreach-focused center to 2,850,000 for a large center in a capital city. The median value for on-site visit numbers was 200,130; the mean was 320,156.

Nearly two-thirds of respondents (122 institutions, or 62%) reported off-site visits as well as on-site visits. Worldwide, the total number of off-site visits reported was over 15 million, with the numbers for individual institutions ranging from 100 to 5 million. The mean number of off-site visits was 123,689; the median value was 51,980.

Figure 8-15 shows the total attendance figures reported by institutions in each region and Figure 8-16 shows mean and median attendance figures for each region.

Figure 8-15 Total visit numbers in each region (millions)

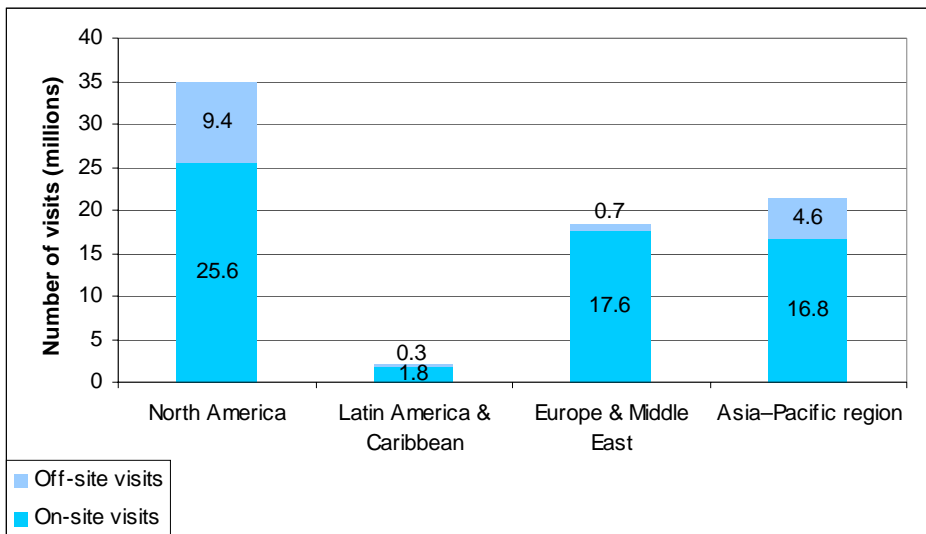


Figure 8-16 Mean and median visit numbers in each region

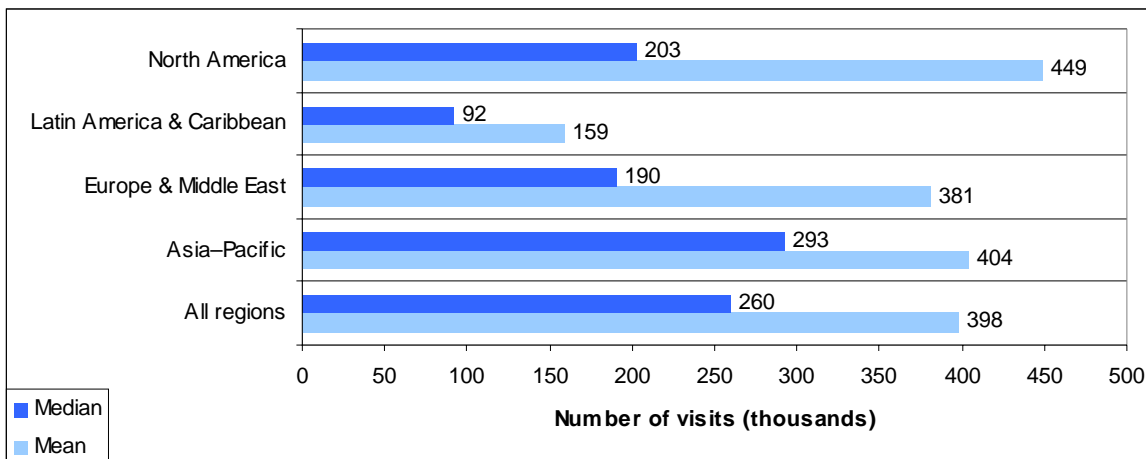


Table 8-15 shows attendance distribution patterns in detail for each region, broken down by institution type and by institution size.

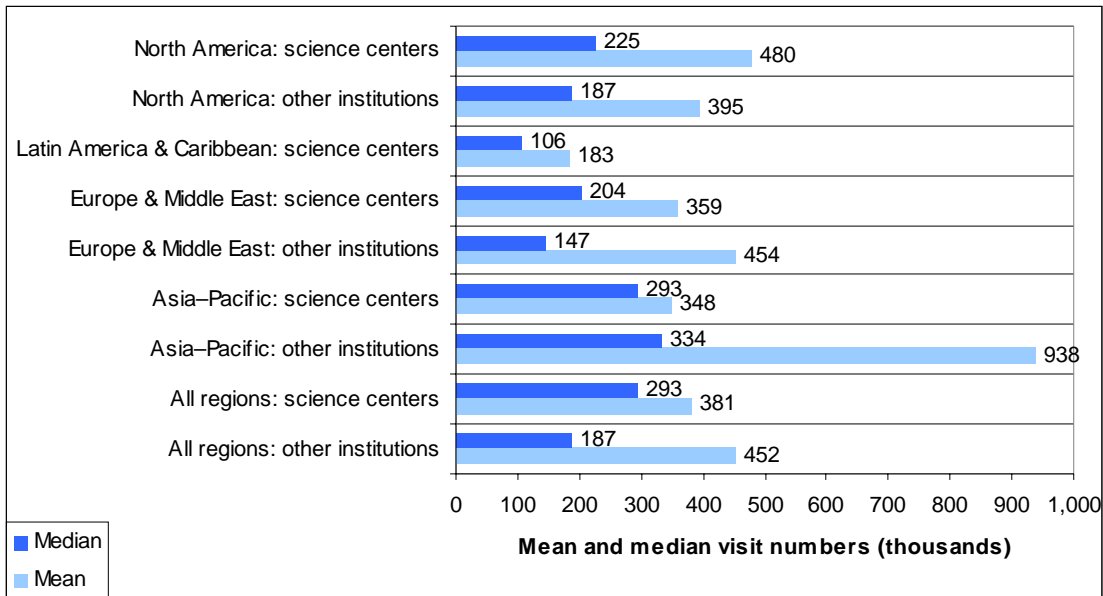
Table 8-15 Total visit numbers by institution type and institution size in each region

Category	Number of visits				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
All respondents*					
Mean	449,476	159,407	380,978	403,731	398,337
Minimum	4,750	5,200	3,000	14,760	3,000
25th percentile	74,836		91,750		99,871
Median	202,651	92,329	189,612		259,694
75th percentile	474,600		377,750		397,300
Maximum	5,515,000	571,478	2,850,000	2,588,770	5,515,000
Sum	35,059,107	2,072,288	18,286,933	21,397,723	76,879,051
Number of respondents	78	13	48	53	193
Science centers*					
Mean	479,835	183,112	359,122	348,087	381,393
Minimum	4,750	5,200	3,000	14,760	3,000
Median	224,530	105,500	204,224		292,771
Maximum	23,991,771	2,014,237	13,287,527	16,708,174	56,064,709
Sum	479,835	183,112	359,122	348,087	381,393
Number of respondents	50	11	37	48	147
Other institution types					
Mean	395,262		454,491	937,910	452,486
Minimum	5,000		40,000	128,727	5,000
Median	186,981		147,000		186,981
Maximum	2,720,327		2,136,000	2,588,770	2,720,327
Sum	11,067,336		4,999,406	4,689,549	20,814,342
Number of respondents	28	2	11	5	46
Very small institutions					
Mean	149,795	53,516	65,269	35,939	96,225
Minimum	4,750	5,200	3,000	14,760	3,000
Median	82,436		55,000		61,059
Maximum	1,110,819	112,000	211,000	71,261	1,110,819
Sum	2,396,725	267,580	848,500	143,756	3,656,561
Number of respondents	16	5	13	4	38
Small institutions*					
Mean	120,235	138,468	183,829		128,383
Minimum	23,000	34,484	55,000		23,000
Median	113,925	89,536			105,500
Maximum	300,021	436,989	435,000		436,989
Sum	2,043,989	830,809	735,316		3,723,114
Number of respondents	17	6	4	1	29
Medium institutions					
Mean	230,669		209,744	289,279	234,588
Minimum	36,809		55,000	94,232	36,809
Median	207,143		175,000		214,584
Maximum	642,000		530,000	402,000	642,000
Sum	3,229,367		2,307,189	1,735,676	7,272,232
Number of respondents	14	0	11	6	31
Large institutions					
Mean	958,742		719,796	467,519	671,379
Minimum	25,000		145,000	128,727	25,000
Median	850,538		378,500		364,913
Maximum	5,515,000		2,850,000	2,588,770	5,515,000
Sum	25,886,026		14,395,928	19,168,291	60,424,144
Number of respondents	27	2	20	41	90

* 'All regions' values include the single South African respondent.

Figure 8-17 shows the mean and median numbers of visits to institutions in each region by institution type, for 193 institutions.

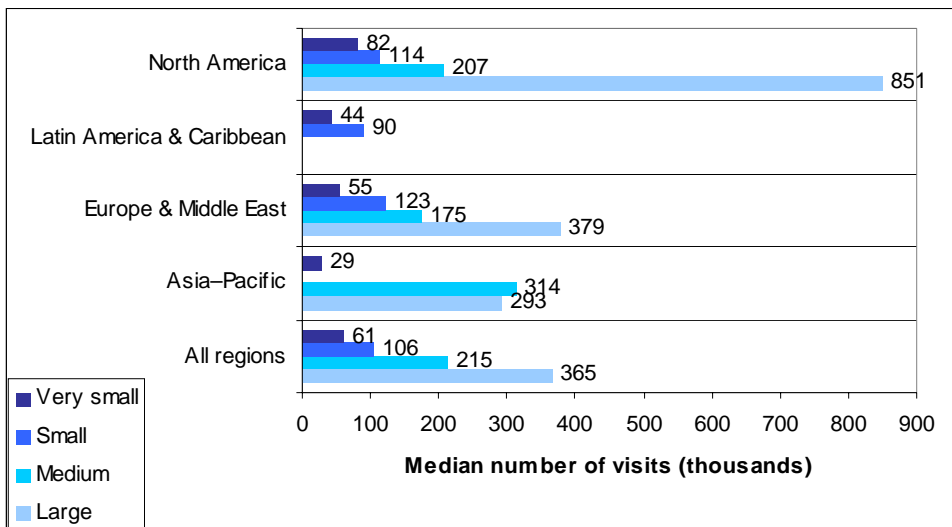
Figure 8-17 Number of visits by institution type in each region (mean and median values)



In the Asia-Pacific region, respondents classifying themselves as ‘science center / museum’ attracted fewer visits, on average, than ‘other institutions’—a result influenced by the dominance of large national museums in the small ‘other’ category for this region. Elsewhere, visit numbers at science centers were higher than visit numbers at ‘other’ respondent institutions.

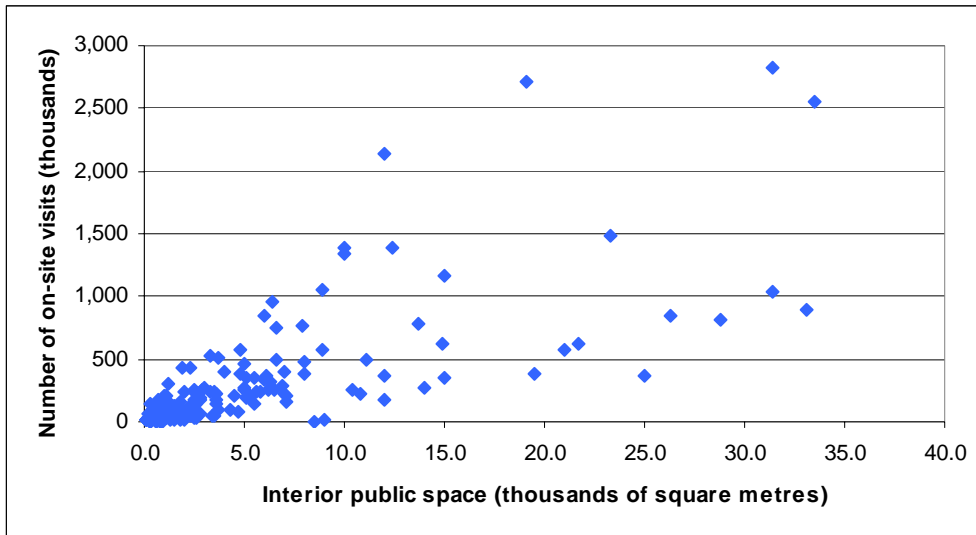
As might be expected, visit numbers were generally larger for larger institutions. Worldwide, the median number of visits to very small institutions was around 61,000, while the median number for large centers was 365,000. Figure 8-18 shows how median visit numbers related to institution size for the 188 institutions that provided both sets of information.

Figure 8-18 Median number of visits by institution size in each region



The correlation is of course only approximate, as there are many different sets of circumstances in which institutions of similar sizes operate. This is shown by Figure 8-19, which plots on-site visit numbers against institution size as measured by total interior public space. (Four institutions with very high values for either visit numbers or floor space have been excluded in order to maintain a useful scale for this scatter graph.)

Figure 8-19 Number of on-site visits compared to institution size for all respondents



Visitors from outside an institution’s local region

The survey questionnaire asked respondents to provide an estimate of the percentage of visitors from outside the economic region in which their institution operates, e.g. city, county or state. Nearly three-quarters of respondents (141 institutions, or 73%) answered this question. The percentage of out-of-region visitors ranged from 5% to 98%, with a median value of 36% and a mean of 39%. This suggests that for a significant proportion of science centers, spending by out-of-region visitors probably makes a useful contribution to the economy of the region surrounding the center.

Table 8-16 shows that the distribution of values for ‘percentage of out-of-region visitors’ is similar in the four geographical regions we are considering.

Table 8-16 Percentage of visitors from outside each institution’s local region

	Percentage of visitors from outside institution’s local region				All regions
	North America	Latin America & Caribbean	Europe & Middle East	Asia–Pacific region	
Mean	35%	45%	42%	41%	39%
Minimum	5%	5%	5%	5%	5%
Median	34%	49%	40%	40%	36%
Maximum	95%	85%	98%	85%	98%
Number of respondents	61	12	45	22	141

8.7 Employees and volunteers

A total of 16,879 people were employed in 171 respondent institutions. Of these paid employees, 10,756 (64%) worked full time and 6,123 (36%) worked part time; only 135 institutions reported having part-time employees. In addition, 119 institutions reported the involvement of a total of 26,546 volunteers.

Figure 8-20 shows the total numbers of paid full-time staff and paid part-time staff in each region, and Figure 8-21 shows the mean and median numbers of staff employed by respondent institutions in each region. Overall, North American institutions employed a larger proportion of staff on a part-time basis than institutions in other regions.

Note that different institutions reported staff numbers in different ways. Some reported only full-time and part-time staff numbers, some reported only full-time equivalent (FTE) numbers, and some reported both. While 137 institutions provided a value for their FTE staffing number, a further 30 reported zero part-time employees. For these 30 institutions, the reported number of full-time employees has been used as their full-time equivalent. The variations in reporting are reflected in the different sample sizes shown in Figure 8-21. Any comparisons should be made with care.

FTE staff number

The number of full-time equivalent (FTE) staff is calculated by (a) working out how many full-time employees would be needed if all part-time hours were divided among full-time employees and then (b) adding this number to the number of actual full-time employees.

Figure 8-20 Total numbers of paid employees in respondent institutions in each region

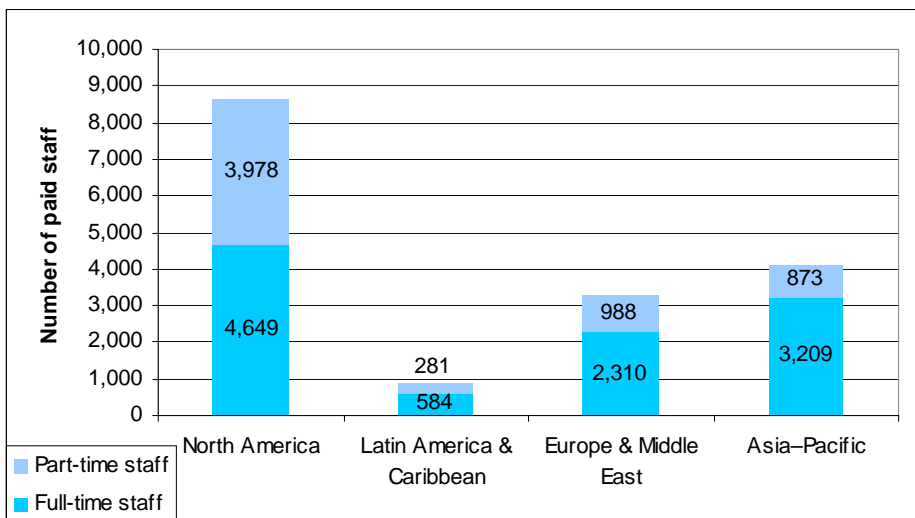
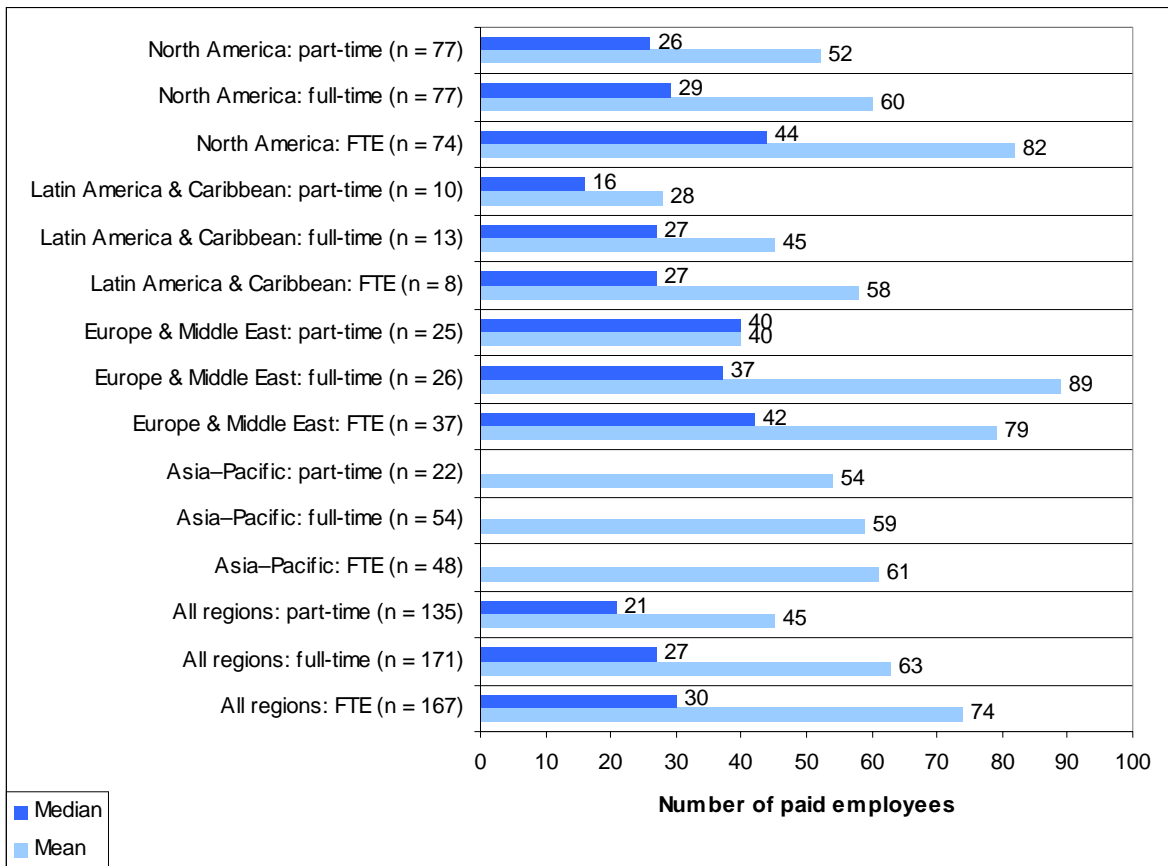


Figure 8-21 Mean and median numbers of paid employees in respondent institutions in each region



North American institutions made greater use of volunteers than institutions in other regions, as shown in Figure 8-22. The median number of volunteers in a North American institution was 200 (mean: 303), compared with 18 (mean: 29) in Latin America & the Caribbean, 13 (mean: 25) in Europe & the Middle East, and 90 (mean: 186) in the Asia-Pacific region.

Figure 8-22 Total number of volunteers in respondent institutions in each region

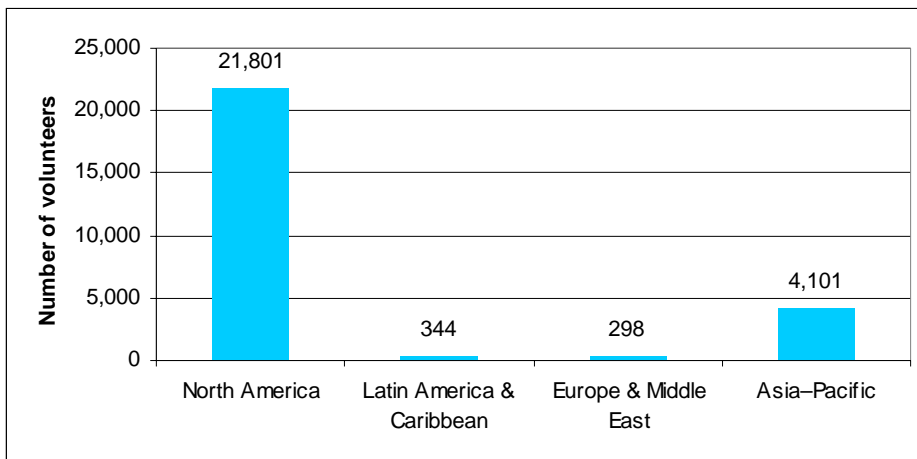


Table 8-17 shows details of the staffing patterns for respondent institutions in each region.

Table 8-17 Total staff numbers in respondent institutions in each region

Category of staff	Number of people in staff category				All regions
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	
Full-time employees*					
Mean	60	45	89	59	63
Minimum	0	1	0	2	0
25th percentile	10		17		14
Median	29	27	37		27
75th percentile	75		66		72
Maximum	275	193	945	320	945
Sum	4,649	584	2,310	3,209	10,756
Number of respondents	77	13	26	54	171
Part-time employees*					
Mean	52	28	40	54	45
Minimum	1	1	5	1	1
25th percentile	6		15		8
Median	26	16	40		21
75th percentile	56		55		52
Maximum	307	72	142	350	350
Sum	3,978	281	988	873	6,123
Number of respondents	77	10	25	22	135
Full-time equivalent (paid staff)					
Mean	82	58	79	61	74
Minimum	0.2	3	2	4	0.2
25th percentile	16		16		18
Median	44	27	42		30
75th percentile	110		85		87
Maximum	362	193	700	335	700
Sum	6,087	463	2,923	2,946	12,420
Number of respondents	74	8	37	48	167
Volunteers*					
Mean	303	29	25	186	223
Minimum	6	2	1	9	1
25th percentile	84		5		20
Median	200	18	13		108
75th percentile	332		19		280
Maximum	1,861	180	125	793	1,861
Sum	21,801	344	298	4,101	26,546
Number of respondents	72	12	12	22	119
All paid and unpaid workers*					
Mean	395	93	139	152	254
Minimum	3	16	21	17	3
25th percentile	111		55		28
Median	266	61	77		108
75th percentile	483		108		315
Maximum	1,984	373	1,178	1,268	1,984
Sum	30,388	1,209	3,606	8,183	43,396
Number of respondents	77	13	26	54	171

* 'All regions' values include the single South African respondent.

Table 8-18 shows FTE staff numbers by institution type and institution size in each region, expanding on the information about total FTE numbers in each region shown in Table 8-17 above.

Table 8-18 Full-time equivalent staff numbers by institution type and institution size in each region

Category	Full-time equivalent staff numbers				
	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions
Science centers					
Mean	87	66	52	54	67
Minimum	0	4	2	6	0
Median	42	39	40		27
Maximum	362	193	156	308	362
Sum	4,162	460	1,414	2,387	8,423
Number of respondents	48	7	27	44	126
Other institution types					
Mean	74		151	185	100
Minimum	2		6	70	2
Median	44		51		48
Maximum	325		700	335	700
Sum	1,926		1,509	555	3,993
Number of respondents	26	1	10	3	40
Very small institutions					
Mean	18	15	19	13	17
Minimum	0	3	2	6	0
Median	13	4	14		12
Maximum	52	39	60	26	60
Sum	266	46	204	38	553
Number of respondents	15	3	11	3	32
Small institutions					
Mean	25	38	35		27
Minimum	5	11	10		5
Median	24	15	28		21
Maximum	86	88	73		88
Sum	423	114	139		681
Number of respondents	17	3	4	1	25
Medium institutions					
Mean	54		50	60	53
Minimum	16		16	51	16
Median	48		40		48
Maximum	130		103	70	130
Sum	757		450	179	1,386
Number of respondents	14	0	9	3	26
Large institutions					
Mean	173		164	62	116
Minimum	5		35	27	5
Median	182		101		68
Maximum	362		700	335	700
Sum	4,325		2,131	2,411	9,171
Number of respondents	25	2	13	39	79

Figure 8-23 and Figure 8-24 show the breakdown of paid FTE employee numbers by institution type and by institution size in each region.

Figure 8-23 Mean and median values of full-time equivalent staff numbers by institution type in each region

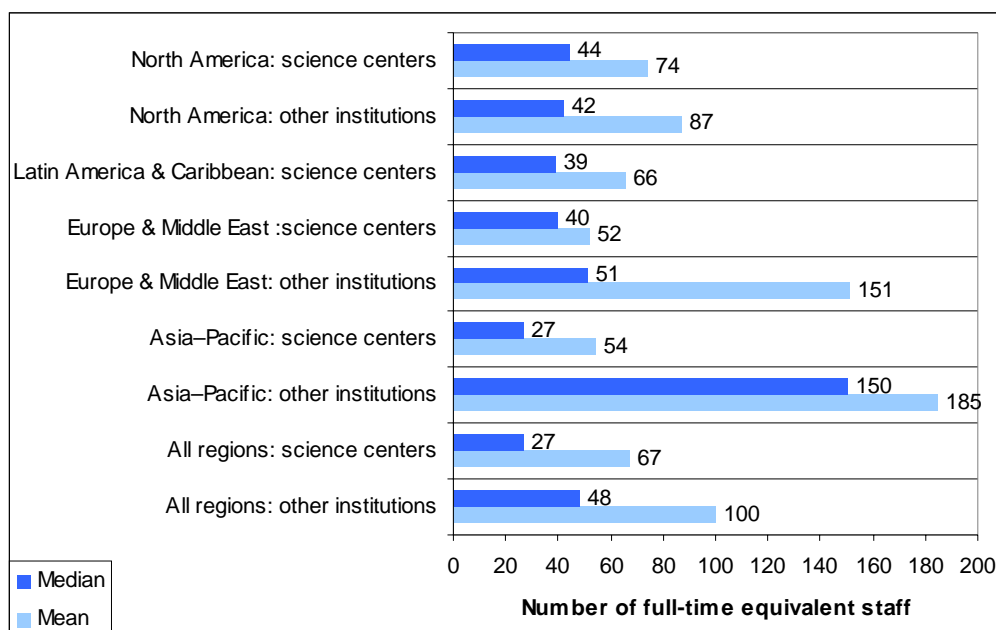
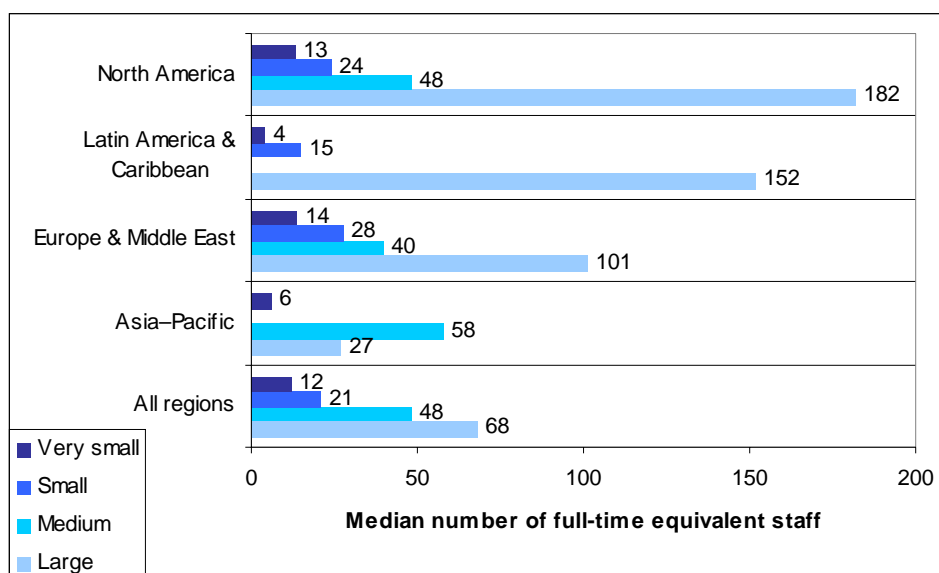


Figure 8-24 Median number of full-time equivalent staff by institution size in each region



8.8 Performance ratios

Various ratios comparing expenditure, staff numbers, floor space and visit numbers can be used to summarise respondent institution performance in different contexts.

Table 8-19 and Figures 8-25 to 8-28 set out four of these ratios for respondent institutions in each region. Table 8-11, showing operating cost per FTE employee, could also be considered in this context.

Table 8-19 Some performance indicators for respondents in each region

	North America	Latin America & Caribbean	Europe & Middle East	Asia-Pacific region	All regions*
Number of on-site visits per square metre of interior public space					
Mean	86	72	79	48	72
Minimum	2	4	5	4	2
Median	64	55	62		51
Maximum	433	227	272	154	433
Number of respondents	74	13	48	51	187
Total number of visits per FTE employee (including off-site visits)					
Mean	5,801	3,740	4,716	8,538	6,221
Minimum	780	1,246	1,133	858	780
Median	4,980	3,310	4,143		5,390
Maximum	23,750	7,033	10,400	10,843	23,750
Number of respondents	74	8	37	46	165
Operating cost per square metre in US dollars					
Mean	1,479	434	1,450	459	1,106
Minimum	17	96	166	33	17
Median	1,100	307	992		760
Maximum	5,004	1,671	6,527	5,000	6,527
Number of respondents	74	13	46	52	186
Operating cost per visit—based on total visit numbers—in US dollars					
Mean	17	7	20	6	14
Minimum	2	1	5	1	1
Median	14	6	15		12
Maximum	77	18	73	46	77
Number of respondents	77	13	46	53	190

*All regions' values include the single South African respondent.

On average, institutions in the Asia-Pacific region had a smaller number of on-site visits per square metre than institutions in the other regions, but a larger total number of visits per FTE employee.

Comparisons of operating cost per square metre of public space, or operating cost per visit, follow a similar pattern to comparisons of total operating expenditure (see discussion following Table 8-8). Amounts spent are considerably larger for institutions in North America and Europe & the Middle East than for institutions in Latin America & the Caribbean or in the Asia-Pacific region, possibly reflecting differences among the economies in different countries.

Figure 8-25 Number of on-site visits per square metre for each region

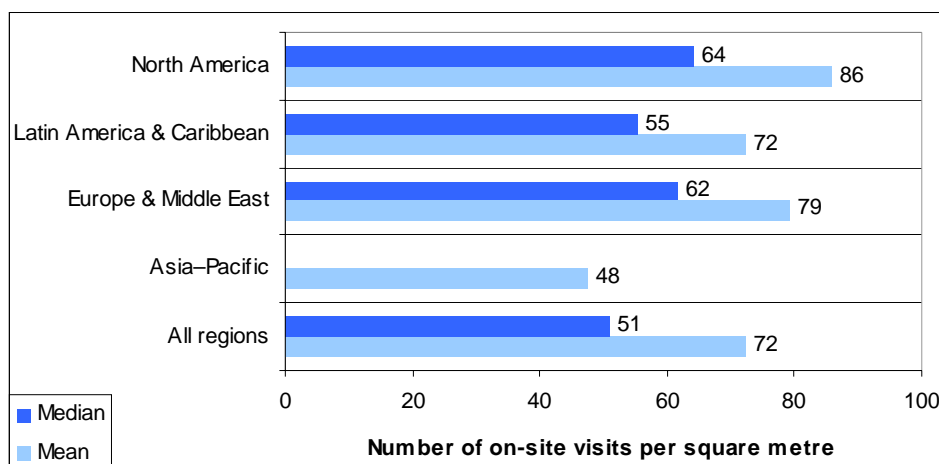


Figure 8-26 Number of visits per full-time equivalent employee for each region

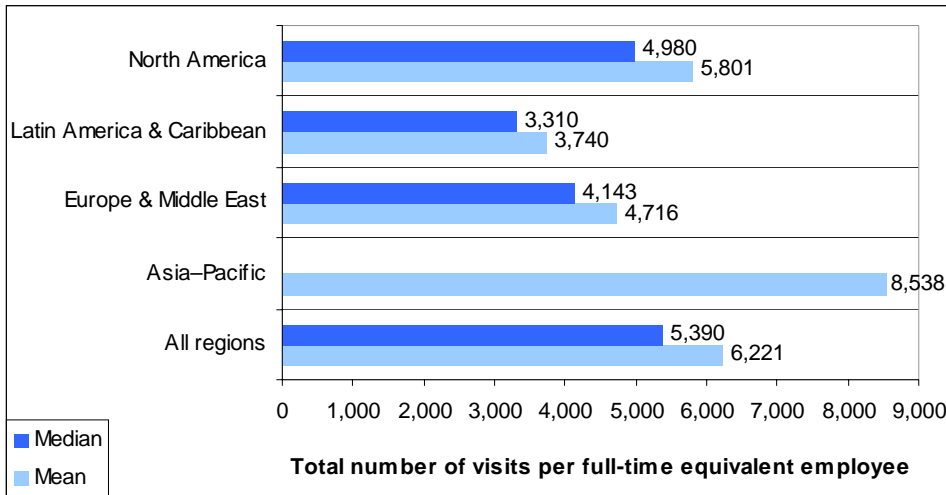


Figure 8-27 Operating cost per square metre of interior public space for each region

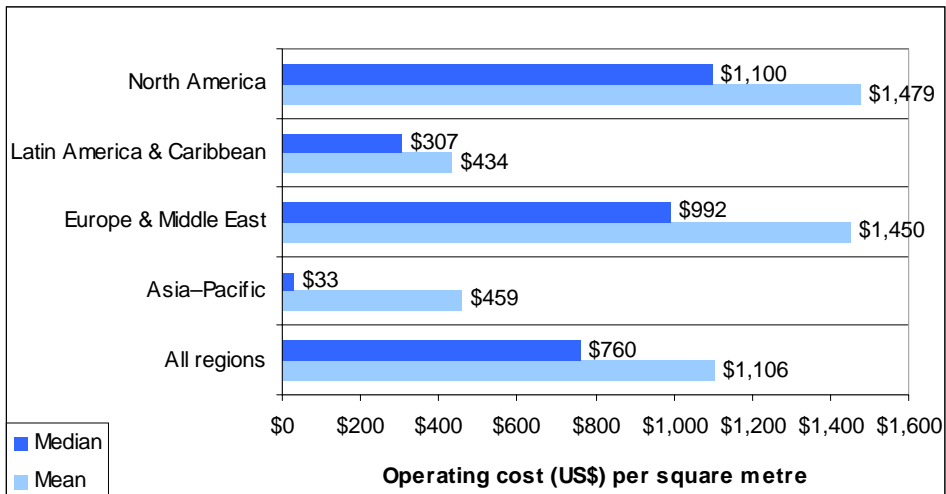
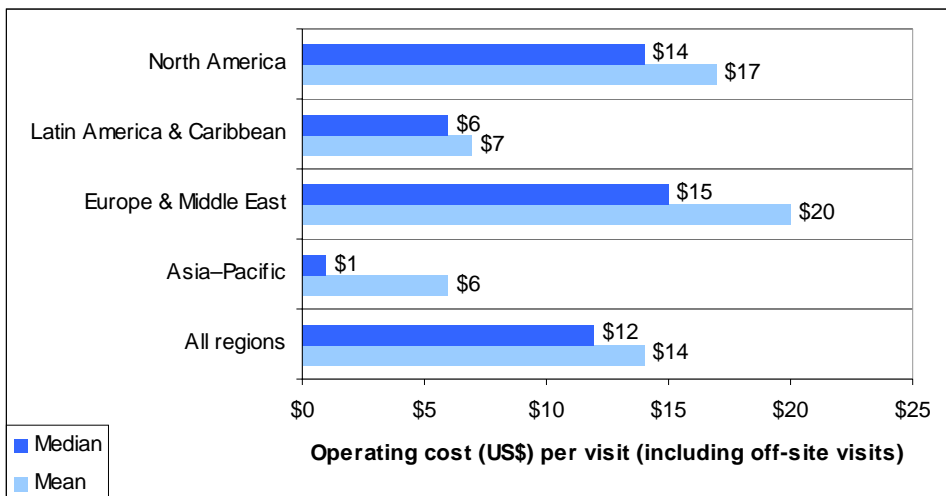


Figure 8-28 Operating cost per visit for each region, based on total number of visits



A final reminder: many of the comparisons that we have made of data by institution type and institution size have limited validity. This is partly because of small sample size in some of the groups. Also, the averaging of data for the Indian science centers distorted distribution patterns for this region’s data and also, to a lesser extent, the patterns for ‘all regions’ data.