

Pathology Service

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|------|------|
| # cases submitted to the diagnostic service | 35 | 39 | 44 | 49 | 38 | 80 | 95 |
| # submitting facilities | 26 | 25 | 27 | 29 | 23 | 43 | 46 |
| # facilities reporting clinical disease | 19 | 23 | 22 | 19 | 10 | 31 | 30 |
| total # fish submitted | 277 | 348 | 496 | 576 | 591 | 1111 | 1441 |

Percentages of total fish examined and submitting facilities diagnosed with the disease

| | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities |
|---|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|
| <i>Pseudoloma neurophilia</i> | 10.83 | 19.23 | 11.21 | 52.00 | 21.37 | 62.96 | 20.49 | 51.72 | 30.29 | 73.91 | 17.46 | 46.51 | 13.12 | 60.87 |
| <i>Pleistophora hyphessobryconis</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.22 | 6.90 | 0.34 | 4.35 | 0.27 | 4.65 | 1.53 | 4.35 |
| <i>Mycobacterium</i> spp. | 6.86 | 46.15 | 6.32 | 36.00 | 9.88 | 48.15 | 4.69 | 34.48 | 5.25 | 43.48 | 5.31 | 32.56 | 5.27 | 43.48 |
| Bacterial infection (non-acid fast) | 4.33 | 26.92 | 0.57 | 8.00 | 0.40 | 7.41 | 0.52 | 10.34 | 0.00 | 0.00 | 0.36 | 6.98 | 0.42 | 10.87 |
| <i>Pseudocapillaria tomentosa</i> | 0.00 | 0.00 | 3.16 | 20.00 | 0.60 | 11.11 | 0.17 | 3.45 | 1.18 | 13.04 | 3.60 | 16.28 | 1.32 | 13.04 |
| Other helminths | 0.00 | 0.00 | 2.30 | 12.00 | 0.00 | 0.00 | 0.17 | 3.45 | 0.17 | 4.35 | 0.09 | 2.33 | 0.14 | 4.35 |
| <i>Myxidium streisingeri</i> | 3.25 | 11.54 | 3.45 | 20.00 | 2.82 | 22.22 | 1.91 | 20.69 | 4.06 | 30.43 | 4.23 | 27.91 | 4.02 | 34.78 |
| Fungal infection | 0.00 | 0.00 | 0.29 | 4.00 | 0.20 | 3.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 2.33 | 0.35 | 2.17 |
| hepatic megalocytosis | 3.25 | 11.54 | 2.59 | 12.00 | 7.26 | 25.93 | 14.76 | 34.48 | 13.71 | 30.43 | 13.68 | 34.88 | 6.11 | 32.61 |
| Egg-associated inflammation/oophoritis | 13.72 | 61.54 | 10.92 | 36.00 | 19.76 | 55.56 | 12.15 | 68.97 | 6.26 | 43.48 | 5.22 | 39.53 | 4.44 | 52.17 |
| Nephrocalcinosis | 1.08 | 11.54 | 0.86 | 4.00 | 2.62 | 18.52 | 2.08 | 20.69 | 1.35 | 26.09 | 2.52 | 25.58 | 2.15 | 30.43 |
| Gill lesions | 5.78 | 15.38 | 0.86 | 8.00 | 2.62 | 11.11 | 2.78 | 17.24 | 3.21 | 8.70 | 6.84 | 32.56 | 2.91 | 23.91 |
| <i>Edwardsiella ictaluri</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.08 | 6.98 | 0.00 | 0.00 |
| Duct hyperplasia (pancreatic or biliary) | 2.17 | 23.08 | 1.44 | 16.00 | 4.03 | 44.44 | 1.22 | 20.69 | 1.69 | 21.74 | 1.89 | 13.95 | 1.11 | 19.57 |
| Intestinal neoplasia, dysplasia, or hyperplasia | 2.53 | 11.54 | 1.44 | 16.00 | 4.03 | 22.22 | 1.39 | 10.34 | 3.21 | 8.70 | 7.11 | 11.63 | 1.94 | 6.52 |
| Seminoma | 6.86 | 23.08 | 1.72 | 12.00 | 2.62 | 25.93 | 1.74 | 20.69 | 0.85 | 17.39 | 1.89 | 18.60 | 1.60 | 28.26 |
| Ultimobranchial adenoma or adenocarcinoma | 0.00 | 0.00 | 0.29 | 4.00 | 1.41 | 14.81 | 1.74 | 13.79 | 1.02 | 21.74 | 0.90 | 13.95 | 0.28 | 8.70 |
| Chordoma | 0.36 | 3.85 | 0.00 | 0.00 | 0.20 | 3.70 | 0.17 | 3.45 | 0.34 | 8.70 | 0.09 | 2.33 | 0.00 | 0.00 |
| Other neoplasia | 1.81 | 15.38 | 1.44 | 12.00 | 2.22 | 25.93 | 1.04 | 10.34 | 1.35 | 8.70 | 0.81 | 13.95 | 0.56 | 13.04 |
| Spinal deformity (in histologic sections) | 2.53 | 15.38 | 0.29 | 4.00 | 1.21 | 11.11 | 1.91 | 20.69 | 0.34 | 4.35 | 0.99 | 9.30 | 1.39 | 26.09 |
| <i>Piscinoodinium pillulare</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.80 | 2.33 | 0.83 | 2.17 |
| Aerocystitis - etiology unknown | 1.44 | 11.54 | 2.30 | 20.00 | 1.61 | 25.93 | 0.52 | 6.90 | 0.00 | 0.00 | 1.08 | 6.98 | 0.21 | 6.52 |
| Coelomitis - etiology unknown | 1.44 | 15.38 | 0.57 | 8.00 | 0.60 | 7.41 | 1.39 | 17.24 | 0.68 | 13.04 | 2.43 | 18.60 | 1.18 | 19.57 |
| Intersex | 0.00 | 0.00 | 0.57 | 8.00 | 0.20 | 3.70 | 0.17 | 3.45 | 0.34 | 8.70 | 0.09 | 2.33 | 0.21 | 4.35 |

Pathology Service

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|------|------|------|------|------|------|
| # cases submitted to the diagnostic service | 96 | 60 | 51 | 64 | 53 | 48 | 40 |
| # submitting facilities | 68 | 28 | 28 | 33 | 35 | 29 | 26 |
| # facilities reporting clinical disease | 47 | 18 | 17 | 22 | 25 | 22 | 16 |
| total # fish submitted | 1294 | 1279 | 762 | 737 | 698 | 511 | 766 |

Percentages of total fish examined and subr

| | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities | fish | facilities |
|---|-------|------------|-------|------------|-------|------------|------|------------|-------|------------|------|------------|------|------------|
| <i>Pseudoloma neurophilia</i> | 11.44 | 30.88 | 11.73 | 39.29 | 7.74 | 46.43 | 9.09 | 39.39 | 14.90 | 34.29 | 9.39 | 27.59 | 9.40 | 46.15 |
| <i>Pleistophora hyphessobryconis</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 3.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <i>Mycobacterium</i> spp. | 6.18 | 33.82 | 3.44 | 42.86 | 5.77 | 39.29 | 2.85 | 21.21 | 3.58 | 25.71 | 5.48 | 34.48 | 2.74 | 26.92 |
| Bacterial infection (non-acid fast) | 0.39 | 2.94 | 0.08 | 3.57 | 0.39 | 10.71 | 0.81 | 12.12 | 0.57 | 11.43 | 0.39 | 6.90 | 0.13 | 3.85 |
| <i>Pseudocapillaria tomentosa</i> | 1.47 | 8.82 | 1.33 | 14.29 | 0.66 | 14.29 | 0.68 | 9.09 | 0.00 | 0.00 | 0.39 | 3.45 | 1.04 | 7.69 |
| Other helminths | 0.08 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 |
| <i>Myxidium streisingeri</i> | 2.32 | 14.71 | 2.74 | 25.00 | 4.72 | 25.00 | 2.31 | 18.18 | 5.87 | 17.14 | 7.83 | 20.69 | 4.83 | 34.62 |
| Fungal infection | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 3.57 | 0.27 | 6.06 | 0.29 | 5.71 | 0.39 | 6.90 | 0.52 | 7.69 |
| hepatic megalocytosis | 8.04 | 17.65 | 12.04 | 64.29 | 12.47 | 28.57 | 0.54 | 6.06 | 1.58 | 20.00 | 4.31 | 20.69 | 6.92 | 11.54 |
| Egg-associated inflammation/oophoritis | 10.59 | 36.76 | 11.88 | 67.86 | 11.29 | 57.14 | 3.26 | 33.33 | 3.87 | 22.86 | 6.07 | 37.93 | 3.52 | 34.62 |
| Nephrocalcinosis | 3.25 | 19.12 | 2.42 | 39.29 | 2.62 | 25.00 | 1.63 | 21.21 | 1.29 | 20.00 | 1.17 | 13.79 | 4.05 | 26.92 |
| Gill lesions | 3.55 | 20.59 | 2.03 | 35.71 | 1.97 | 25.00 | 9.36 | 30.30 | 5.87 | 42.86 | 5.87 | 27.59 | 0.78 | 11.54 |
| <i>Edwardsiella ictaluri</i> | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Duct hyperplasia (pancreatic or biliary) | 1.08 | 14.71 | 1.02 | 21.43 | 2.49 | 35.71 | 1.09 | 12.12 | 2.44 | 20.00 | 2.74 | 13.79 | 1.17 | 15.38 |
| Intestinal neoplasia, dysplasia, or hyperplasia | 2.01 | 11.76 | 2.27 | 21.43 | 1.97 | 17.86 | 3.93 | 21.21 | 3.87 | 25.71 | 6.26 | 17.24 | 4.70 | 23.08 |
| Seminoma | 1.39 | 14.71 | 1.95 | 28.57 | 2.10 | 21.43 | 1.63 | 18.18 | 1.43 | 17.14 | 0.98 | 13.79 | 3.26 | 19.23 |
| Ultimobranchial adenoma or adenocarcinoma | 0.77 | 8.82 | 0.39 | 7.14 | 0.66 | 7.14 | 0.41 | 9.09 | 0.57 | 8.57 | 0.00 | 0.00 | 0.91 | 7.69 |
| Chordoma | 0.00 | 0.00 | 0.00 | 0.00 | 1.57 | 25.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 | 10.34 | 0.13 | 3.85 |
| Other neoplasia | 1.31 | 14.71 | 0.63 | 17.86 | 2.23 | 25.00 | 2.31 | 24.24 | 2.72 | 22.86 | 0.59 | 10.34 | 2.61 | 34.62 |
| Spinal deformity (in histologic sections) | 0.93 | 11.76 | 2.97 | 42.86 | 0.00 | 0.00 | 1.09 | 18.18 | 1.15 | 17.14 | 5.68 | 24.14 | 1.57 | 23.08 |
| <i>Piscinoodinium pillulare</i> | 0.54 | 1.47 | 0.00 | 0.00 | 1.44 | 7.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Aerocystitis - etiology unknown | 0.70 | 7.35 | 1.17 | 21.43 | 0.79 | 14.29 | 0.68 | 9.09 | 0.57 | 11.43 | 0.59 | 3.45 | 0.39 | 11.54 |
| Coelomitis - etiology unknown | 2.01 | 20.59 | 3.67 | 35.71 | 0.00 | 0.00 | 0.68 | 12.12 | 0.86 | 11.43 | 2.94 | 13.79 | 0.78 | 15.38 |
| Intersex | 0.15 | 2.94 | 0.16 | 3.57 | 0.13 | 3.57 | 0.27 | 6.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 3.85 |

| Year | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | |
|---|------|---|------|---|------|---|------|---|------|---|------|---|------|----|
| Total # Main Room fish sampled | 170 | | 132 | | 698 | | 395 | | 411 | | 389 | | 499 | |
| # Quarantine Room fish sampled | 0 | | 2 | | 1 | | 0 | | 0 | | 11 | | 117 | |
| Total number of fish diagnosed with the disease in the ZIRC Main Fish Room (M) and Quarantine Room (Q) | | | | | | | | | | | | | | |
| | M | Q | M | Q | M | Q | M | Q | M | Q | M | Q | M | Q |
| <i>Pseudoloma neurophilia</i> | 25 | - | 27 | 0 | 182 | 0 | 58 | - | 49 | - | 0 | 3 | 0 | 15 |
| <i>Pleistophara hyphessobryconis</i> | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| <i>Mycobacterium</i> spp.* | 46 | - | 3 | 0 | 50 | 0 | 7 | - | 7 | - | 27 | 0 | 15 | 4 |
| Bacterial infection (non-acid fast) | 2 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 1 | 0 |
| <i>Pseudocapillaria tomentosa</i> | 0 | - | 0 | 0 | 0 | 1 | 0 | - | 0 | - | 0 | 0 | 0 | 8 |
| Other helminths | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| <i>Myxidium streisingeri</i> | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| Fungal infection | 1 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 1 | 0 |
| hepatic megalocytosis | 12 | - | 9 | 0 | 31 | 0 | 28 | - | 33 | - | 59 | 1 | 62 | 6 |
| Egg-associated inflammation/oophoritis | 20 | - | 25 | 0 | 123 | 0 | 26 | - | 12 | - | 8 | 0 | 8 | 0 |
| Nephrocalcinosis | 2 | - | 0 | 0 | 9 | 0 | 4 | - | 2 | - | 4 | 0 | 15 | 1 |
| Gill lesions | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 8 | 1 | 10 |
| <i>Edwardsiella ictaluri</i> | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| Duct hyperplasia (pancreatic or biliary) | 0 | - | 0 | 0 | 9 | 0 | 0 | - | 0 | - | 0 | 0 | 3 | 3 |
| Intestinal neoplasia, dysplasia, or hyperplasia | 0 | - | 0 | 0 | 0 | 0 | 2 | - | 0 | - | 3 | 0 | 1 | 2 |
| Seminoma | 0 | - | 0 | 0 | 0 | 0 | 2 | - | 0 | - | 0 | 0 | 0 | 0 |
| Ultimobranchial adenoma or adenocarcinoma | 1 | - | 0 | 0 | 4 | 0 | 4 | - | 0 | - | 0 | 0 | 1 | 0 |
| Chordoma | 0 | - | 1 | 1 | 2 | 0 | 1 | - | 0 | - | 1 | 0 | 2 | 1 |
| Other neoplasia | 2 | - | 0 | 0 | 20 | 0 | 11 | - | 0 | - | 1 | 0 | 3 | 1 |
| Spinal deformity (in histologic sections) | 0 | - | 3 | 0 | 2 | 0 | 6 | - | 0 | - | 17 | 0 | 3 | 0 |
| <i>Piscinoodinium pillulare</i> | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| Aerocystitis - etiology unknown | 0 | - | 2 | 2 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |
| Coelomitis - etiology unknown | 1 | - | 1 | 0 | 6 | 0 | 5 | - | 1 | - | 1 | 0 | 2 | 3 |
| Intersex | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | - | 0 | 0 | 0 | 0 |

| Year | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2019 | |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Total # Main Room fish sampled | 787 | | 1038 | | 1330 | | 1435 | | 1374 | | 1145 | | 1494 | |
| # Quarantine Room fish sampled | 125 | | 308 | | N/A | | 382 | | 177 | | 180 | | 89 | |
| Total number of fish diagnosed with the disease in | | | | | | | | | | | | | | |
| | M | Q | M | Q | M | Q | M | Q | M | Q | M | Q | M | Q |
| <i>Pseudoloma neurophilia</i> | 24 | 18 | 130 | 26 | 134 | - | 265 | 4 | 203 | 4 | 343 | 31 | 289 | 1 |
| <i>Pleistophara hyphessobryconis</i> | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Mycobacterium</i> spp.* | 2 | 1 | 10 | 7 | 13 | - | 13 | 12 | 26 | 3 | 9 | 3 | 56 | 1 |
| Bacterial infection (non-acid fast) | 0 | 0 | 0 | 0 | 0 | - | 1 | 1 | 3 | 0 | 3 | 0 | 1 | 0 |
| <i>Pseudocapillaria tomentosa</i> | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| Other helminths | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Myxidium streisingeri</i> | 0 | 0 | 0 | 32 | 0 | - | 0 | 3 | 0 | 9 | 0 | 47 | 0 | 7 |
| Fungal infection | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| hepatic megalocytosis | 104 | 9 | 157 | 14 | 163 | - | 326 | 29 | 443 | 18 | 287 | 4 | 181 | 2 |
| Egg-associated inflammation/oophoritis | 55 | 9 | 58 | 1 | 75 | - | 81 | 1 | 61 | 5 | 42 | 5 | 102 | 0 |
| Nephrocalcinosis | 18 | 0 | 16 | 0 | 12 | - | 9 | 1 | 6 | 0 | 11 | 0 | 76 | 0 |
| Gill lesions | 3 | 20 | 0 | 14 | 0 | - | 0 | 0 | 2 | 14 | 1 | 14 | 7 | 3 |
| <i>Edwardsiella ictaluri</i> | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Duct hyperplasia (pancreatic or biliary) | 2 | 3 | 2 | 0 | 4 | - | 4 | 5 | 6 | 0 | 8 | 2 | 4 | 3 |
| Intestinal neoplasia, dysplasia, or hyperplasia | 3 | 1 | 12 | 2 | 15 | - | 16 | 0 | 21 | 4 | 8 | 0 | 9 | 0 |
| Seminoma | 5 | 0 | 3 | 1 | 3 | - | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 |
| Ultimobranchial adenoma or adenocarcinoma | 5 | 1 | 1 | 0 | 1 | - | 3 | 0 | 5 | 0 | 11 | 0 | 13 | 0 |
| Chordoma | 2 | 0 | 2 | 0 | 1 | - | 0 | 0 | 3 | 0 | 4 | 0 | 4 | 0 |
| Other neoplasia | 14 | 2 | 10 | 1 | 18 | - | 5 | 0 | 21 | 0 | 8 | 0 | 11 | 0 |
| Spinal deformity (in histologic sections) | 6 | 0 | 12 | 0 | 33 | - | 4 | 0 | 18 | 0 | 13 | 0 | 7 | 0 |
| <i>Piscinoodinium pillulare</i> | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aerocystitis - etiology unknown | 1 | 3 | 5 | 0 | 1 | - | 8 | 1 | 24 | 0 | 9 | 0 | 6 | 0 |
| Coelomitis - etiology unknown | 2 | 5 | 4 | 2 | 9 | - | 10 | 1 | 21 | 0 | 8 | 4 | 22 | 0 |
| Intersex | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |