**Supplemental Digital Content**

**The supplements contain the appendix 1-6.**

**Appendix 1.** Specific searching strategy and history for each database.

1. **Pubmed:**

 (((((re-implant\*[Title/Abstract]) OR (reimplant\*[Title/Abstract])) OR (reinsert\*[Title/Abstract])) OR (re-insert\*[Title/Abstract])) OR (reoperat\*[Title/Abstract])) AND ("Cochlear Implants"[Mesh] OR "Cochlear Implantation"[Mesh]) Sort by: Most Recent

1. **Web of science:**

 (((((TS=(re-implant\*)) OR TS=(reimplant\*)) OR TS=(re-insert\*)) OR TS=(reinsert\*)) OR TS=(reoperat\*)) AND TS=(Cochlear Implant\*)

1. **Ovid Medline**

1 exp Cochlear Implantation/ (7515)

2 exp Cochlear Implants/ (10928)

3 re-implant\*.mp. (1003)

4 reimplant\*.mp. (7952)

5 reinsert\*.mp. (2522)

6 re-insert\*.mp. (317)

7 reoperat\*.mp. (110371)

8 1 or 2 (13937)

9 3 or 4 or 5 or 6 or 7 (120237)

1. 8 and 9 (460)
2. **EMBASE**

1 exp cochlear implantation/ (4690)

2 exp cochlea prosthesis/ (16837)

3 re-implant\*.mp. (2239)

4 reimplant\*.mp. (16236)

5 re-insert\*.mp. (777)

6 reinsert\*.mp. (3988)

7 reoperat\*.mp. (110109)

8 1 or 2 (18325)

9 3 or 4 or 5 or 6 or 7 (130351)

10 8 and 9 (467)

1. **Chinese National Knowledge Infrastructure,**

(篇关摘=人工耳蜗 + 电子耳蜗 + 人工听觉 + 耳蜗植入) AND (篇关摘=再植入 + 再次植入 + 二次植入)

1. **VIP Chinese Science and Technology Periodicals Database**

题名或关键词=人工耳蜗+电子耳蜗+人工听觉+耳蜗植入 AND 题名或关键词=再植入+再次植入+二次植入

1. **Wanfang Data**

题名或关键词:(人工耳蜗 or 电子耳蜗 or 人工听觉 or 耳蜗植入) and 题名或关键词:(再植入 or 再次植入 or 二次植入)

**Appendix 2.** Characteristics of 144 studies included in this literature review.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Author Name | Year of publication | Years Included in Study | country | No. of PCI | Reimplantation | ipsilateral | contralateral | device failure | medical reason | update | other |
| No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Ahmad M. Aldhafeeri, et al. | 2021 | 2011.1-2017.7 | Kingdom of Saudi Arabia | 886 | 36 | 4.1% | NR | NR | NR | NR | 27 | 75.0% | 9 | 25.0% | 0 | 0.0% | 0 | 0.0% |
| Eleanor Layfieldi, et al. | 2021 | 2009.1.1-2018.12.31 | USA | 468 | 30 | 6.4% | NR | NR | NR | NR | 26 | 86.7% | 3 | 10.0% | 0 | 0.0% | 0 | 0.0% |
| Pabina Rayamajhi, et al. | 2020 | 1997.6-2019.12 | India | 1555 | 81 | 5.2% | 80 | 98.8% | 1 | 1.2% | 68 | 84.0% | 13 | 16.0% | 0 | 0.0% | 0 | 0.0% |
| Birgul Gumus, et al. | 2020 | 2005.8-2019.8 | Turkey | 490 | 27 | 5.5% | 23 | 85.2% | 4 | 14.8% | 18 | 66.7% | 9 | 33.3% | 0 | 0.0% | 0 | 0.0% |
| Jingyuan Chen, et al. | 2021 | 1996.1-2019.12 | China | 4447 | 116 | 2.6% | 97 | 83.6% | 9 | 7.8% | 85 | 73.3% | 21 | 18.1% | 0 | 0.0% | 0 | 0.0% |
| R. Hermann, et al. | 2020 | 2012.1.1-2016.12.31 | France | 4952 | 99 | 2.0% | NR | NR | NR | NR | 49 | 49.5% | 39 | 39.4% | 0 | 0.0% | 11 | 11.1% |
| Yann-Fuu Kou, et al. | 2020 | 1986-2013 | USA | 834 | 40 | 4.8% | NR | NR | NR | NR | 36 | 90.0% | 4 | 10.0% | 0 | 0.0% | 0 | 0.0% |
| Muhammed Dağkıran, et al. | 2020 | 2000.3-2-2019.9 | Turkey | 1452 | 40 | 2.8% | NR | NR | NR | NR | 29 | 72.5% | 11 | 27.5% | 0 | 0.0% | 0 | 0.0% |
| M. Bourdoncle, et al. | 2020 | 2013.3.1-2016.12.31 | France | 772 | 49 | 6.3% | NR | NR | NR | NR | 30 | 61.2% | 19 | 38.8% | 0 | 0.0% | 0 | 0.0% |
| Ciaran Lane, et al. | 2019 | 1988.1.1-2017.3.31 | Canada | 781 | 23 | 2.9% | NR | NR | NR | NR | 19 | 82.6% | 4 | 17.4% | 0 | 0.0% | 0 | 0.0% |
| MO Batuk, et al. | 2019 | 1997.11-2017.8 | Turkey | 2058 | 123 | 6.0% | 117 | 95.1% | 6 | 4.9% | 75 | 61.0% | 50 | 40.7% | 2 | 1.6% | 0 | 0.0% |
| Yi Jiang, et al. | 2019 | 2002.7-2017.5 | China | 3031 | 31 | 1.0% | 26 | 83.9% | 5 | 16.1% | 28 | 90.3% | 3 | 9.7% | 0 | 0.0% | 0 | 0.0% |
| Abha Kumari, et al. | 2019 | 1997-2016 | India | 1500 | 53 | 3.5% | NR | NR | NR | NR | 39 | 73.6% | 14 | 26.4% | 0 | 0.0% | 0 | 0.0% |
| Shawn M. Stevens, et al. | 2019 | 2001-2016 | USA | 512 | 20 | 3.9% | 17 | 85.0% | 3 | 15.0% | 20 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Meredith A. Holcomb, et al. | 2018 | NR | USA | NR | 10 | NR | NR | NR | NR | NR | 1 | 10.0% | 0 | 0.0% | 9 | 90.0% | 0 | 0.0% |
| Maria Stella Arantes do Amaral, et al. | 2018 | 2004-2015 | Brazil | 265 | 9 | 3.4% | 8 | 88.9% | 1 | 11.1% | 2 | 22.2% | 7 | 77.8% | 0 | 0.0% | 0 | 0.0% |
| Recep Karamert, et al. | 2019 | 2002.7-2018.3 | Turkey | 802 | 42 | 5.2% | 24 | 57.1% | 18 | 42.9% | 30 | 71.4% | 19 | 45.2% | 0 | 0.0% | 0 | 0.0% |
| C. Wijaya, et al. | 2019 | 1995.1-2016.6 | Ireland | 1017 | 56 | 5.5% | 50 | 89.3% | 6 | 10.7% | 35 | 62.5% | 21 | 37.5% | 0 | 0.0% | 0 | 0.0% |
| Maria Stella A. Amaral, et al. | 2019 | 2004-2016 | Brazil | 158 | 2 | 1.3% | 2 | 100.0% | 0 | 0.0% | 0 | 0.0% | 2 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| Simple Ravikumar Bhadania, et al. | 2018 | 2004.6-2014.6 | India | 250 | 10 | 4.0% | NR | NR | NR | NR | 3 | 30.0% | 7 | 70.0% | 0 | 0.0% | 0 | 0.0% |
| L. Distinguin, et al. | 2017 | 1996-2013 | France | 665 | 69 | 10.4% | NR | NR | NR | NR | 50 | 72.5% | 15 | 21.7% | 4 | 5.8% | 0 | 0.0% |
| Jeffrey Yeung, et al. | 2018 | 1995.1-2015.12 | USA | 806 | 62 | 7.7% | 62 | 100.0% | 0 | 0.0% | 50 | 80.6% | 12 | 19.4% | 0 | 0.0% | 0 | 0.0% |
| Ashish Vashishth, et al. | 2018 | NR | Italy | 36 | 4 | 11.1% | 3 | 75.0% | 1 | 25.0% | 0 | 0.0% | 4 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| Philip A. Gardner, et al. | 2018 | 2004-2014 | USA | 579 | 31 | 5.4% | NR | NR | NR | NR | 27 | 87.1% | 4 | 12.9% | 0 | 0.0% | 0 | 0.0% |
| David Ulanovsk, et al. | 2017 | 2000-2012 | Israel | 350 | 26 | 7.4% | NR | NR | NR | NR | 19 | 73.1% | 7 | 26.9% | 0 | 0.0% | 0 | 0.0% |
| Timmermans M, et al. | 2018 | 1987-2017 | The Netherland +Belgium | 2571 | 77 | 3.0% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Al Hussein Awad, et al. | 2017 | 2014.10-2016.7 | Egypt | 163 | 6 | 3.7% | 4 | 66.7% | 2 | 33.3% | 3 | 50.0% | 3 | 50.0% | 0 | 0.0% | 0 | 0.0% |
| Cubillana-Herrero JD, et al. | 2018 | 2003.1-2010.12 | Spain | 64 | 3 | 4.7% | NR | NR | NR | NR | 2 | 66.7% | 1 | 33.3% | 0 | 0.0% | 0 | 0.0% |
| Mariana Reis, et al. | 2017 | 2006.1-2015.6 | Australia | 1968 | 87 | 4.4% | NR | NR | NR | NR | 53 | 60.9% | 34 | 39.1% | 0 | 0.0% | 0 | 0.0% |
| Chung-Feng Hwang, et al. | 2016 | 1999-2014 | China | 589 | 13 | 2.2% | NR | NR | NR | NR | 8 | 61.5% | 5 | 38.5% | 0 | 0.0% | 0 | 0.0% |
| Uma Patnaik, et al. | 2016 | 1997.1-2015.1 | India | 534 | 18 | 3.4% | NR | NR | NR | NR | 10 | 55.6% | 8 | 44.4% | 0 | 0.0% | 0 | 0.0% |
| R. Manrique-Huarte, et al. | 2015 | 1989-2012 | Spain | 962 | 38 | 4.0% | 38 | 100.0% | 0 | 0.0% | 22 | 57.9% | 16 | 42.1% | 0 | 0.0% | 0 | 0.0% |
| Benjamin J. Googe, et al. | 2016 | 2003.4-2014.10 | USA | 248 | 7 | 2.8% | 7 | 100.0% | 0 | 0.0% | 7 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Francoise Sterkers, et al. | 2015 | 1990-2013 | France | 539 | 45 | 8.3% | 44 | 97.8% | 1 | 2.2% | 35 | 77.8% | 10 | 22.2% | 0 | 0.0% | 0 | 0.0% |
| Gutiérrez-Salazar A, et al. | 2015 | 1991.10-2011.5 | Spain | 808 | 51 | 6.3% | NR | NR | NR | NR | 25 | 49.0% | 19 | 37.3% | 7 | 13.7% | 0 | 0.0% |
| Marion Blanchard, et al. | 2014 | 1990.1-2012.6 | France | 877 | 62 | 7.1% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Marilena Trozzi, et al. | 2014 | 1992.2-2013.1 | UK | 778 | 30 | 3.9% | 30 | 100.0% | 0 | 0.0% | 17 | 56.7% | 13 | 43.3% | 0 | 0.0% | 0 | 0.0% |
| Anna Balakina, et al. | 2015 | 2006.1.1-2014.12.31 | Russia | 606 | 30 | 5.0% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Levent Olgun, et al. | 2015 | NR | Turkey | 1924 | 96 | 5.0% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Margaret T. Dillon, et al. | 2015 | NR | USA | NR | 29 | NR | NR | NR | NR | NR | 29 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Dragan Dankuc, et al. | 2015 | 2002-2013 | Serbia | 100 | 1 | 1.0% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Yuksel Olgun, et al. | 2014 | 1998-2012.7 | Turkey | 957 | 52 | 5.4% | NR | NR | NR | NR | 41 | 78.8% | 9 | 17.3% | 0 | 0.0% | 2 | 3.8% |
| A. Farinetti, et al. | 2014 | 1993.3-2013.1 | France | 475 | 11 | 2.3% | 6 | 54.5% | 5 | 45.5% | 9 | 81.8% | 2 | 18.2% | 0 | 0.0% | 0 | 0.0% |
| Catherine S. Birman, et al. | 2014 | NR | Australia | NR | 108 | NR | 105 | 97.2% | 3 | 2.8% | 82 | 75.9% | 21 | 19.4% | 0 | 0.0% | 5 | 4.6% |
| Simran Mahtani, et al. | 2014 | 1988-2012 | UK | 649 | 32 | 4.9% | 32 | 100.0% | 0 | 0.0% | 23 | 71.9% | 7 | 21.9% | 2 | 6.3% | 0 | 0.0% |
| Jeffrey T. Wang, et al. | 2014 | 1982.1-2011.6 | Australia | 2827 | 201 | 7.1% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Jumin Sunde, et al. | 2013 | 2000.1-2012.4 | USA | 439 | 13 | 3.0% | NR | NR | NR | NR | 5 | 38.5% | 8 | 61.5% | 0 | 0.0% | 0 | 0.0% |
| David S. Chen, et al. | 2013 | 1999-2011 | USA | 445 | 15 | 3.4% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Jun Ikeya, et al. | 2013 | 1985.12-2007.4 | Japan | 366 | 57 | 15.6% | 40 | 70.2% | 17 | 29.8% | NR | NR | NR | NR | NR | NR | NR | NR |
| Ozgur Tarkan, et al. | 2013 | 2000.3-2012.3 | Turkey | 475 | 13 | 2.7% | 10 | 76.9% | 3 | 23.1% | 10 | 76.9% | 3 | 23.1% | 0 | 0.0% | 0 | 0.0% |
| Seung-Ho Shin, et al. | 2013 | 1988-2011 | Korea | 816 | 22 | 2.7% | NR | NR | NR | NR | 14 | 63.6% | 8 | 36.4% | 0 | 0.0% | 0 | 0.0% |
| Maria Conceição Peixoto , et al. | 2013 | 1992-2001 | Portugal | 132 | 9 | 6.8% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Seied Basir Hashemi, et al. | 2012 | 2003-2009 | Iran | 275 | 5 | 1.8% | NR | NR | NR | NR | 5 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| A. Ciorba, et al. | 2012 | 2003.1.1-2009.12.31 | Italy | 438 | 13 | 3.0% | NR | NR | NR | NR | 9 | 69.2% | 4 | 30.8% | 0 | 0.0% | NR | NR |
| L Masterson, et al. | 2012 | 1986.3-2010.10 | UK | 746 | 33 | 4.4% | 24 | 72.7% | 9 | 27.3% | 20 | 60.6% | 13 | 39.4% | 0 | 0.0% | 0 | 0.0% |
| Kadir Serkan Orhan, et al. | 2012 | 2005.9-2010.6 | Turkey | 344 | 8 | 2.3% | 7 | 87.5% | 1 | 12.5% | 3 | 37.5% | 5 | 62.5% | 0 | 0.0% | 0 | 0.0% |
| Antoine Eskander, et al. | 2011 | 1990-2010.6 | Canada | 971 | 35 | 3.6% | NR | NR | NR | NR | 30 | 85.7% | 5 | 14.3% | 0 | 0.0% | 0 | 0.0% |
| Georgios A. Stamatiou, et al. | 2011 | 1986.4-2010.6 | Greece | 212 | 7 | 3.3% | NR | NR | NR | NR | 6 | 85.7% | 1 | 14.3% | 0 | 0.0% | 0 | 0.0% |
| Emmanuel Lescanne, et al. | 2011 | 1994.1-2010.6 | France | 144 | 8 | 5.6% | NR | NR | NR | NR | 5 | 62.5% | 3 | 37.5% | 0 | 0.0% | 0 | 0.0% |
| Nathan S. Alexande, et al. | 2011 | 1995.7-2009.12 | USA | 320 | 13 | 4.1% | NR | NR | NR | NR | 13 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Doug Chung, et al. | 2010 | 1979-2008 | USA | 1387 | 113 | 8.1% | NR | NR | NR | NR | 40 | 35.4% | 31 | 27.4% | 0 | 0.0% | 42 | 37.2% |
| Kenneth H. Lee, et al. | 2010 | 1999-2006 | USA | 23 | 1 | 4.3% | NR | NR | NR | NR | 0 | 0.0% | 1 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| César Orús Dotú, et al. | 2010 | 1993-2008 | Spain | 146 | 34 | 23.3% | 34 | 100.0% | 0 | 0.0% | 22 | 64.7% | 12 | 35.3% | 0 | 0.0% | 0 | 0.0% |
| Natalie Loundon, et al. | 2010 | 1990.1.1-2008.4.30 | France | 434 | 13 | 3.0% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Jerry W . Lin, et al. | 2010 | 1993-2008 | USA | 264 | 25 | 9.5% | NR | NR | NR | NR | 19 | 76.0% | 6 | 24.0% | 0 | 0.0% | 0 | 0.0% |
| Andrea L. Marlowe, et al. | 2010 | 1991-2006 | USA | 420 | 62 | 14.8% | 60 | 96.8% | 2 | 3.2% | 46 | 74.2% | 14 | 22.6% | 2 | 3.2% | 0 | 0.0% |
| KOS, Maria Izabel, et al. | 2010 | 1985-2009 | Geneva | 206 | 16 | 7.8% | NR | NR | NR | NR | 15 | 93.8% | 1 | 6.3% | 0 | 0.0% | 0 | 0.0% |
|  Jan Gosepath, et al. | 2009 | 1990-2007 | Germany | 422 | 56 | 13.3% | NR | NR | NR | NR | 48 | 85.7% | 8 | 14.3% | 0 | 0.0% | 0 | 0.0% |
| Taryn Davids, et al. | 2009 | 2002.1-2007.12 | Canada | 446 | 16 | 3.6% | NR | NR | NR | NR | 14 | 87.5% | 2 | 12.5% | 0 | 0.0% | 0 | 0.0% |
| MI Trotter, et al. | 2009 | 1982.9-2006.10 | Australia | 1106 | 58 | 5.2% | 49 | 84.5% | 9 | 15.5% | 43 | 74.1% | 15 | 25.9% | 0 | 0.0% | 0 | 0.0% |
| Kevin D. Brown, et al. | 2009 | 1992-2006 | USA | 806 | 44 | 5.5% | 40 | 90.9% | 4 | 9.1% | 34 | 77.3% | 10 | 22.7% | 0 | 0.0% | 0 | 0.0% |
| Tommaso Sorrentino, et al. | 2009 | 1989-2009 | France | 487 | 20 | 4.1% | 18 | 90.0% | 2 | 10.0% | 11 | 55.0% | 9 | 45.0% | 0 | 0.0% | 0 | 0.0% |
| Frederic Venail, et al. | 2008 | 1989.6-2006.12 | France | 500 | 36 | 7.2% | 31 | 86.1% | 3 | 8.3% | 30 | 83.3% | 5 | 13.9% | 1 | 2.8% | 0 | 0.0% |
| Joong Ho Ahn, et al. | 2008 | 1999.4-2006.7 | Korea | 80 | 3 | 3.8% | NR | NR | NR | NR | 2 | 66.7% | 1 | 33.3% | 0 | 0.0% | 0 | 0.0% |
| Alejandro Rivas, et al. | 2008 | 1990-2006 | USA | 825 | 48 | 5.8% | 44 | 91.7% | 4 | 8.3% | 35 | 72.9% | 13 | 27.1% | 0 | 0.0% | 0 | 0.0% |
| Robert D. Cullen, et al. | 2008 | 1991-2005 | USA | 952 | 107 | 11.2% | NR | NR | NR | NR | 65 | 60.7% | 42 | 39.3% | 0 | 0.0% | 0 | 0.0% |
| Mathieu Côté, et al. | 2007 | 1984-2005 | Canada | 668 | 43 | 6.4% | 35 | 81.4% | 8 | 18.6% | 35 | 81.4% | 8 | 18.6% | 0 | 0.0% | 0 | 0.0% |
| Lela Migirov, et al. | 2007 | 1989.6-2005.4 | Israel | 405 | 29 | 7.2% | 23 | 79.3% | 6 | 20.7% | 24 | 82.8% | 5 | 17.2% | 0 | 0.0% | 0 | 0.0% |
| Jose N. Fayad, et al. | 2006 | 1987-2005 | USA | 496 | 18 | 3.6% | 18 | 100.0% | 0 | 0.0% | 15 | 83.3% | 3 | 16.7% | 0 | 0.0% | 0 | 0.0% |
| Elizabeth A. R. Beadle, et al. | 2005 | 1989.1-1992.12 | Greece | 30 | 9 | 30.0% | 8 | 88.9% | 1 | 11.1% | 9 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Sunil N Dutt, et al. | 2005 | 1999-2001 | France | 111 | 4 | 3.6% | 2 | 50.0% | 2 | 50.0% | 1 | 25.0% | 3 | 75.0% | 0 | 0.0% | 0 | 0.0% |
| Tolga Kandogan, et al. | 2005 | 1998-2004.6 | Turkey | 227 | 22 | 9.7% | NR | NR | NR | NR | 22 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
|  Amy-Anne Donatelli Lassig, et al. | 2005 | 1985-2003 | USA | NR | 61 | NR | 54 | 88.5% | 7 | 11.5% | 34 | 55.7% | 21 | 34.4% | 6 | 9.8% | 0 | 0.0% |
| Jan Bernd Weise, et al. | 2005 | 1990.8-2003.11 | Germany | 110 | 6 | 5.5% | 4 | 66.7% | 2 | 33.3% | 3 | 50.0% | 3 | 50.0% | 0 | 0.0% | 0 | 0.0% |
| Jaydip Ray, et al. | 2004 | 1990-2002 | UK | 288 | 16 | 5.6% | 8 | 50.0% | 8 | 50.0% | 9 | 56.3% | 6 | 37.5% | 1 | 6.3% | 0 | 0.0% |
| Susan Waltzman, et al. | 2004 | 1997-2003 | USA | NR | 27 | NR | NR | NR | NR | NR | 21 | 77.8% | 6 | 22.2% | 0 | 0.0% | 0 | 0.0% |
| Jadip Ray, et al. | 2004 | 1984.6-2003.6 | Australia | 844 | 72 | 8.5% | 52 | 72.2% | 20 | 27.8% | 37 | 51.4% | 35 | 48.6% | 0 | 0.0% | 0 | 0.0% |
| Jose N. Fayad, et al. | 2004 | 1990-2002.12 | USA | 638 | 46 | 7.2% | NR | NR | NR | NR | 40 | 87.0% | 6 | 13.0% | 0 | 0.0% | 0 | 0.0% |
| C.H. Raine, et al. | 2004 | 1990-2004 | UK | 305 | 27 | 8.9% | NR | NR | NR | NR | 20 | 74.1% | 3 | 11.1% | 4 | 14.8% | 0 | 0.0% |
| Emmanuel Am Mylanus, et al. | 2003 | 1989-2001 | The Netherland | 140 | 3 | 2.1% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Geert De Ceulaer, et al. | 2003 | NR | UK+Belgium | 92 | 5 | NR | NR | NR | NR | NR | 5 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Jafar Hamzavi, et al. | 2003 | NR | Germany | 66 | 18 | 27.3% | NR | NR | NR | NR | 7 | 38.9% | 0 | 0.0% | 11 | 61.1% | 0 | 0.0% |
| George Alexiades, et al. | 2001 | 1984.2-2000.12 | USA | 618 | 33 | 5.3% | 33 | 100.0% | 0 | 0.0% | 29 | 87.9% | 4 | 12.1% | 0 | 0.0% | 0 | 0.0% |
| Simon C. Parisier, et al. | 2001 | 1990-1999 | USA | 403 | 27 | 6.7% | 27 | 100.0% | 0 | 0.0% | 27 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Ahmed Handoussa, et al. | 2000 | 1993-2000 | Arabia | 73 | 5 | 6.8% | 5 | 100.0% | 0 | 0.0% | 4 | 80.0% | 1 | 20.0% | 0 | 0.0% | 0 | 0.0% |
| Otto Ribari, et al. | 2000 | 1985-1999 | Hungary | 80 | 15 | 18.8% | 8 | 53.3% | 7 | 46.7% | 6 | 40.0% | 9 | 60.0% | 0 | 0.0% | 0 | 0.0% |
| Gysin Claudien, et al. | 2000 | 1990-1998 | Canada | 100 | 4 | 4.0% | NR | NR | NR | NR | 4 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Filipo, R, et al. | 1999 | 1993.3-1998 | Italy | 31 | 5 | 16.1% | NR | NR | NR | NR | 1 | 20.0% | 4 | 80.0% | 0 | 0.0% | 0 | 0.0% |
| Thomas J. Balkany, et al. | 1999 | 1990-1997 | USA | 175 | 16 | 9.1% | NR | NR | NR | NR | 6 | 37.5% | 10 | 62.5% | 0 | 0.0% | 0 | 0.0% |
| Henson, A M, et al. | 1999 | 1987-1996 | USA | NR | 28 | NR | 28 | 100.0% | 0 | 0.0% | 27 | 96.4% | 1 | 3.6% | 0 | 0.0% | 0 | 0.0% |
| Antje Aschendorff, et al. | 1997 | 1993-1997 | Germany | 105 | 2 | 1.9% | NR | NR | NR | NR | 2 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Shakeel R. Saeed, et al. | 1995 | 1988-1995 | UK | 92 | 3 | 3.3% | 2 | 66.7% | 1 | 33.3% | 2 | 66.7% | 1 | 33.3% | 0 | 0.0% | 0 | 0.0% |
| Hongbo Ren, et al. | 2020 | 2009.6-2018.12 | China | 1119 | 24 | 2.1% | 20 | 83.3% | 4 | 16.7% | 20 | 83.3% | 4 | 16.7% | 0 | 0.0% | 0 | 0.0% |
| Jing Luo, et al. | 2020 | 2003.1-2018.10 | China | 1689 | 21 | 1.2% | NR | NR | NR | NR | 5 | 23.8% | 16 | 76.2% | 0 | 0.0% | 0 | 0.0% |
| Shuguang Han, et al. | 2019 | 2015.1-2018.6 | China | NR | 39 | NR | 34 | 87.2% | 5 | 12.8% | 30 | 76.9% | 9 | 23.1% | 0 | 0.0% | 0 | 0.0% |
| Shanshan Zhang, et al. | 2019 | 2012.11-22018.7 | China | NR | 17 | NR | 16 | 94.1% | 1 | 5.9% | 11 | 64.7% | 5 | 29.4% | 0 | 0.0% | 1 | 5.9% |
| HongyanTang , et al. | 2019 | 2013.9-2019.6 | China | 784 | 23 | 2.9% | 20 | 87.0% | 3 | 13.0% | 16 | 69.6% | 7 | 30.4% | 0 | 0.0% | 0 | 0.0% |
| Chunhui Sun, et al. | 2020 | 2009.1-2017.12 | China | 1693 | 12 | 0.7% | 7 | 58.3% | 5 | 41.7% | 5 | 41.7% | 7 | 58.3% | 0 | 0.0% | 0 | 0.0% |
| Xinjian Li, et al. | 2019 | 2016.1-2017.12 | China | 129 | 7 | 5.4% | 7 | 100.0% | 0 | 0.0% | 7 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Yueshuai Song, et al. | 2018 | 2015.1-2018.6 | China | 536 | 33 | 6.2% | 32 | 97.0% | 1 | 3.0% | 30 | 90.9% | 3 | 9.1% | 0 | 0.0% | 0 | 0.0% |
| Yuan Lu, et al. | 2014 | 2002-2012 | China | NR | 25 | NR | 21 | 84.0% | 4 | 16.0% | 13 | 52.0% | 12 | 48.0% | 0 | 0.0% | 0 | 0.0% |
| Yuanyuan Jing, et al. | 2013 | 2005.3-2012.12 | China | NR | 31 | NR | NR | NR | NR | NR | 0 | 0.0% | 15 | 48.4% | 1 | 3.2% | 15 | 48.4% |
| Linge Wang et al. | 2011 | 2007.5-2010.11 | China | NR | 23 | NR | NR | NR | NR | NR | 11 | 47.8% | 9 | 39.1% | 0 | 0.0% | 3 | 13.0% |
| Shuyi Zhao, et al. | 2008 | 2002.2-2006.11 | China | 103 | 4 | 3.9% | 4 | 100.0% | 0 | 0.0% | 4 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Lisheng Yu, et al. | 2004 | 2000.6-2004.3 | China | 36 | 6 | 16.7% | NR | NR | NR | NR | 5 | 83.3% | 1 | 16.7% | 0 | 0.0% | 0 | 0.0% |
| Daohang Zhang, et al. | 2008 | 1998.1-2008.2 | China | 1068 | 7 | 0.7% | NR | NR | NR | NR | 5 | 71.4% | 0 | 0.0% | 0 | 0.0% | 2 | 28.6% |
| Jianhua Qiu, et al. | 2010 | 2000.12-2010.8 | China | 416 | 2 | 0.5% | 0 | 0.0% | 2 | ##### | 0 | 0.0% | 2 | 100.0% | 0 | 0.0% | NR | NR |
| Zheming Wu, et al. | 2018 | 1999-2004 | China | 589 | 14 | 2.4% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Shiming Yang, et al. | 2013 | 1997.3-2013.5 | China | 1681 | 15 | 0.9% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Willi Roßberg,et al. | 2021 | NR | Germany | NR | 5 | NR | 5 | 100.0% | 0 | 0.0% | 3 | 60.0% | 1 | 20.0% | 1 | 20.0% | 0 | 0.0% |
| Chanida Kanchanalarp,et al. | 2005 | 1999-2003 | Thailand | 10 | 3 | 30.0% | NR | NR | NR | NR | 0 | 0.0% | 3 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| Robert L. Webb,et al. | 1991 | 1982.9.14-1991 | Australia | 97 | 3 | 3.1% | 2 | 66.7% | 1 | 33.3% | 3 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Ian M, Windmill,et al. | 1990 | 1987-1990 | USA | 17 | 3 | 17.6% | 1 | 33.3% | 2 | 66.7% | NR | NR | NR | NR | NR | NR | NR | NR |
| Noel L. Cohen,et al. | 1993 | 1993 | USA | 80 | 4 | 5.0% | NR | NR | NR | NR | 4 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
|  Baren JP,et al. | 2014 | 1990-2012 | UK | 831 | 67 | 8.1% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Kyle S. Kimura | 2020 | 2005-2015 | USA | 1469 | 81 | 5.5% | NR | NR | NR | NR | 67 | 82.7% | 14 | 17.3% | 0 | 0.0% | 0 | 0.0% |
| Smith A.J, et al. | 2020 | NR | NR | 358 | 12 | 3.4% | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Jun Ho Lee, et al. | 2016 | 1988.3-2015.6 | Korea | 1729 | 48 | 2.8% | NR | NR | NR | NR | 46 | 95.8% | 2 | 4.2% | 0 | 0.0% | 0 | 0.0% |
| Daniel Jun Yi Wong, et al. | 2016 | 2001-2010 | Australia | 150 | 5 | 3.3% | NR | NR | NR | NR | 5 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| S. Raghunandhan, et al. | 2011 | 2006.11-2010.11 | India | 300 | 10 | 3.3% | NR | NR | NR | NR | 5 | 50.0% | 5 | 50.0% | 0 | 0.0% | 0 | 0.0% |
| Glynn, F, et al. | 2012 | 1988-2011 | NR | 637 | 31 | 4.9% | NR | NR | NR | NR | 19 | 61.3% | 10 | 32.3% | 2 | 6.5% | 0 | 0.0% |
| Al-Muhaimeed, et al. | 2011 | NR | Saudi Arabia | 117 | 4 | 3.4% | NR | NR | NR | NR | 0 | 0.0% | 4 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| Sh. Mohammadi, et al. | 2011 | 1992-2009 | Iran | 1412 | 74 | 5.2% | NR | NR | NR | NR | 67 | 90.5% | 7 | 9.5% | 0 | 0.0% | 0 | 0.0% |
| T Ovesen, et al. | 2009 | 1998-2007 | Denmark | 311 | 2 | 0.6% | 2 | 100.0% | 0 | 0.0% | 0 | 0.0% | 2 | 100.0% | 0 | 0.0% | 0 | 0.0% |
| J. Ray, et al. | 1998 | 1986-1997 | UK | 132 | 9 | 6.8% | 4 | 44.4% | 5 | 55.6% | 4 | 44.4% | 1 | 11.1% | 4 | 44.4% | 0 | 0.0% |
| Richard T. Miyamoto, et al. | 1997 |  | USA | 180 | 20 | 11.1% | NR | NR | NR | NR | 11 | 55.0% | 9 | 45.0% | 0 | 0.0% | 0 | 0.0% |
| Robert K. Jackler, et al. | 1989 | NR | USA | 1280 | 38 | 3.0% | NR | NR | NR | NR | 16 | 42.1% | 22 | 57.9% | 0 | 0.0% | 0 | 0.0% |
| Tapani Jauhiainen, et al. |  | 1984-1985 | Finland | 10 | 3 | 30.0% | NR | NR | NR | NR | 3 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| L Ali, et al. | 2010 | 2009-2010 | NR | 33 | 1 | 3.0% | NR | NR | NR | NR | 1 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Yasheng Yuan, et al. | 2014 | 2007.10-2009.10 | China | NR | 7 | NR | NR | NR | NR | NR | 2 | 28.6% | 5 | 71.4% | 0 | 0.0% | 0 | 0.0% |
| Xinmeng Men, et al. | 2017 | 2013.12-2015.9 | China | 78 | 3 | 3.8% | NR | NR | NR | NR | 3 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Wenkui Lin, et al. | 2020 | 2010.5-2019.4 | China | 497 | 3 | 0.6% | 3 | 100.0% | 0 | 0.0% | 1 | 33.3% | 1 | 33.3% | 0 | 0.0% | 1 | 33.3% |
| Yu Wang, et al. | 2017 | 2002.3-2016.11 | China | 280 | 3 | 1.1% | 2 | 66.7% | 1 | 33.3% | 2 | 66.7% | 1 | 33.3% | 0 | 0.0% | 0 | 0.0% |
| Sadie Khwaja, et al. | 2012 | NR | UK | 22 | 1 | 4.5% | NR | NR | NR | NR | 1 | 100.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |

PCI: Primary Cochlear Implantation. NR: Not reported.

**Appendix 3.** The forest plot of the pooled prevalence of cochlear reimplantation in children.

****

**Appendix 4.** The forest plot of the pooled prevalence of cochlear reimplantation in adults.

****

**Appendix 5.** The sensitivity analysis of included studies: the impact on the pooled estimate caused by each study.

|  |  |  |
| --- | --- | --- |
| **Study omitted**  | **Estimate** | **95% Confidence interval** |
| **Lower limits** | **Upper limits** |
| Ahmad M. Aldhafeeri, et al. | 0.0467 | 0.0424 | 0.0511 |
| Eleanor Layfieldi, et al. | 0.0465 | 0.0422 | 0.0508 |
| Pabina Rayamajhi, et al. | 0.0466 | 0.0423 | 0.0509 |
| Birgul Gumus, et al. | 0.0465 | 0.0422 | 0.0508 |
| Jingyuan Chen, et al. | 0.0470 | 0.0426 | 0.0514 |
| R. Hermann, et al. | 0.0471 | 0.0427 | 0.0516 |
| Yann-Fuu Kou, et al. | 0.0467 | 0.0423 | 0.0510 |
| Muhammed Dağkıran, et al. | 0.0469 | 0.0426 | 0.0513 |
| M. Bourdoncle, et al. | 0.0465 | 0.0422 | 0.0508 |
| Ciaran Lane, et al. | 0.0469 | 0.0425 | 0.0512 |
| MO Batuk, et al. | 0.0465 | 0.0422 | 0.0508 |
| Yi Jiang, et al. | 0.0471 | 0.0428 | 0.0515 |
| Abha Kumari, et al. | 0.0468 | 0.0425 | 0.0512 |
| Shawn M. Stevens, et al. | 0.0467 | 0.0424 | 0.0511 |
| Maria Stella Arantes do Amaral, et al. | 0.0468 | 0.0425 | 0.0511 |
| Recep Karamert, et al. | 0.0467 | 0.0424 | 0.0510 |
| C. Wijaya, et al. | 0.0466 | 0.0423 | 0.0509 |
| Maria Stella A. Amaral, et al. | 0.0470 | 0.0427 | 0.0513 |
| Simple Ravikumar Bhadania, et al. | 0.0467 | 0.0424 | 0.0510 |
| L. Distinguin, et al. | 0.0461 | 0.0419 | 0.0504 |
| Jeffrey Yeung, et al. | 0.0464 | 0.0421 | 0.0506 |
| Ashish Vashishth, et al. | 0.0466 | 0.0423 | 0.0509 |
| Philip A. Gardner, et al. | 0.0466 | 0.0423 | 0.0509 |
| David Ulanovsk, et al. | 0.0464 | 0.0422 | 0.0507 |
| Timmermans M, et al. | 0.0469 | 0.0425 | 0.0513 |
| Al Hussein Awad, et al. | 0.0467 | 0.0424 | 0.0511 |
| Cubillana-Herrero JD, et al. | 0.0467 | 0.0424 | 0.0510 |
| Mariana Reis, et al. | 0.0467 | 0.0424 | 0.0510 |
| Chung-Feng Hwang, et al. | 0.0469 | 0.0426 | 0.0513 |
| Uma Patnaik, et al. | 0.0468 | 0.0425 | 0.0511 |
| R. Manrique-Huarte, et al. | 0.0468 | 0.0424 | 0.0511 |
| Benjamin J. Googe, et al. | 0.0468 | 0.0425 | 0.0511 |
| Francoise Sterkers, et al. | 0.0463 | 0.0420 | 0.0506 |
| Gutiérrez-Salazar A, et al. | 0.0465 | 0.0422 | 0.0508 |
| Marion Blanchard, et al. | 0.0464 | 0.0421 | 0.0507 |
| Marilena Trozzi, et al. | 0.0468 | 0.0424 | 0.0511 |
| Anna Balakina, et al. | 0.0466 | 0.0423 | 0.0510 |
| Levent Olgun, et al. | 0.0466 | 0.0423 | 0.0509 |
| Dragan Dankuc, et al. | 0.0470 | 0.0427 | 0.0513 |
| Yuksel Olgun, et al. | 0.0466 | 0.0423 | 0.0509 |
| A. Farinetti, et al. | 0.0469 | 0.0426 | 0.0512 |
| Simran Mahtani, et al. | 0.0466 | 0.0423 | 0.0510 |
| Jeffrey T. Wang, et al. | 0.0463 | 0.0421 | 0.0505 |
| Jumin Sunde, et al. | 0.0468 | 0.0425 | 0.0512 |
| David S. Chen, et al. | 0.0468 | 0.0425 | 0.0511 |
| Jun Ikeya, et al. | 0.0459 | 0.0417 | 0.0502 |
| Ozgur Tarkan, et al. | 0.0469 | 0.0425 | 0.0512 |
| Seung-Ho Shin, et al. | 0.0469 | 0.0426 | 0.0512 |
| Maria Conceição Peixoto, et al. | 0.0466 | 0.0423 | 0.0509 |
| Seied Basir Hashemi, et al. | 0.0469 | 0.0426 | 0.0513 |
| A. Ciorba, et al. | 0.0468 | 0.0425 | 0.0512 |
| L Masterson, et al. | 0.0467 | 0.0424 | 0.0510 |
| Kadir Serkan Orhan, et al. | 0.0469 | 0.0426 | 0.0512 |
| Antoine Eskander, et al. | 0.0468 | 0.0425 | 0.0511 |
| Georgios A. Stamatiou, et al. | 0.0468 | 0.0425 | 0.0511 |
| Emmanuel Lescanne, et al. | 0.0466 | 0.0423 | 0.0509 |
| Nathan S. Alexande, et al. | 0.0467 | 0.0424 | 0.0510 |
| Doug Chung, et al. | 0.0463 | 0.0420 | 0.0505 |
| Kenneth H. Lee, et al. | 0.0467 | 0.0424 | 0.0510 |
| César Orús Dotú, et al. | 0.0469 | 0.0425 | 0.0512 |
| Natalie Loundon, et al. | 0.0468 | 0.0425 | 0.0512 |
| Jerry W. Lin, et al. | 0.0463 | 0.0421 | 0.0506 |
| Andrea L. Marlowe, et al. | 0.0459 | 0.0417 | 0.0502 |
| KOS, Maria Izabel, et al. | 0.0465 | 0.0422 | 0.0508 |
| Jan Gosepath, et al. | 0.0460 | 0.0418 | 0.0503 |
| Taryn Davids, et al. | 0.0468 | 0.0425 | 0.0511 |
| MI Trotter, et al. | 0.0466 | 0.0423 | 0.0509 |
| Kevin D. Brown, et al. | 0.0466 | 0.0423 | 0.0509 |
| Tommaso Sorrentino, et al. | 0.0467 | 0.0424 | 0.0510 |
| Frederic Venail, et al. | 0.0464 | 0.0421 | 0.0507 |
| Joong Ho Ahn, et al. | 0.0467 | 0.0424 | 0.0510 |
| Alejandro Rivas, et al. | 0.0465 | 0.0422 | 0.0509 |
| Robert D. Cullen, et al. | 0.0460 | 0.0418 | 0.0502 |
| Mathieu Côté, et al. | 0.0465 | 0.0422 | 0.0508 |
| Lela Migirov, et al. | 0.0465 | 0.0422 | 0.0508 |
| Jose N. Fayad, et al. | 0.0468 | 0.0425 | 0.0511 |
| Elizabeth A. R. Beadle, et al. | 0.0465 | 0.0422 | 0.0508 |
| Sunil N Dutt, et al. | 0.0467 | 0.0424 | 0.0510 |
| Tolga Kandogan, et al. | 0.0464 | 0.0421 | 0.0507 |
| Jan Bernd Weise, et al. | 0.0466 | 0.0423 | 0.0509 |
| Jaydip Ray, et al. | 0.0466 | 0.0423 | 0.0509 |
| Jaydip Ray, et al. | 0.0463 | 0.0420 | 0.0505 |
| Jose N. Fayad, et al. | 0.0464 | 0.0421 | 0.0507 |
| C.H. Raine, et al. | 0.0464 | 0.0421 | 0.0507 |
| Emmanuel Am Mylanus, et al. | 0.0469 | 0.0426 | 0.0512 |
| Jafar Hamzavi, et al. | 0.0463 | 0.0420 | 0.0506 |
| George Alexiades, et al. | 0.0466 | 0.0423 | 0.0509 |
| Simon C. Parisier, et al. | 0.0465 | 0.0422 | 0.0508 |
| Ahmed Handoussa, et al. | 0.0466 | 0.0423 | 0.0509 |
| Otto Ribari, et al. | 0.0464 | 0.0421 | 0.0506 |
| Gysin Claudien, et al. | 0.0467 | 0.0424 | 0.0510 |
| Filipo, R, et al. | 0.0465 | 0.0423 | 0.0508 |
| Thomas J. Balkany, et al. | 0.0464 | 0.0421 | 0.0507 |
| Antje Aschendorff, et al. | 0.0469 | 0.0426 | 0.0512 |
| Shakeel R. Saeed, et al. | 0.0468 | 0.0424 | 0.0511 |
| Hongbo Ren, et al. | 0.0470 | 0.0426 | 0.0513 |
| Jing Luo, et al. | 0.0471 | 0.0427 | 0.0514 |
| HongyanTang , et al. | 0.0469 | 0.0425 | 0.0512 |
| Chunhui Sun, et al. | 0.0471 | 0.0428 | 0.0514 |
| Xinjian Li, et al. | 0.0466 | 0.0423 | 0.0509 |
| Yueshuai Song, et al. | 0.0465 | 0.0422 | 0.0508 |
| Shuyi Zhao, et al. | 0.0467 | 0.0424 | 0.0510 |
| Lisheng Yu, et al. | 0.0465 | 0.0422 | 0.0508 |
| Daohang Zhang, et al. | 0.0471 | 0.0428 | 0.0514 |
| Jianhua Qiu, et al. | 0.0471 | 0.0428 | 0.0514 |
| Zheming Wu, et al. | 0.0469 | 0.0426 | 0.0512 |
| Shiming Yang, et al. | 0.0471 | 0.0428 | 0.0514 |
| Chanida Kanchanalarp, et al. | 0.0466 | 0.0423 | 0.0509 |
| Robert L. Webb, et al. | 0.0468 | 0.0425 | 0.0511 |
| Ian M, Windmill, et al. | 0.0466 | 0.0423 | 0.0509 |
| Noel L. Cohen, et al. | 0.0467 | 0.0423 | 0.0510 |
|  Baren JP, et al. | 0.0463 | 0.0420 | 0.0506 |
| Kyle S. Kimura | 0.0466 | 0.0423 | 0.0509 |
| Smith A.J, et al. | 0.0468 | 0.0425 | 0.0511 |
| Jun Ho Lee, et al. | 0.0469 | 0.0426 | 0.0513 |
| Daniel Jun Yi Wong, et al. | 0.0468 | 0.0425 | 0.0511 |
| S. Raghunandhan, et al. | 0.0468 | 0.0425 | 0.0511 |
| Glynn, F, et al. | 0.0466 | 0.0423 | 0.0510 |
| Al-Muhaimeed, et al. | 0.0468 | 0.0424 | 0.0511 |
| Sh. Mohammadi, et al. | 0.0466 | 0.0423 | 0.0509 |
| T Ovesen, et al. | 0.0471 | 0.0428 | 0.0514 |
| J. Ray, et al. | 0.0466 | 0.0423 | 0.0509 |
| Richard T. Miyamoto, et al. | 0.0463 | 0.0420 | 0.0506 |
| Robert K. Jackler, et al. | 0.0469 | 0.0425 | 0.0512 |
| Tapani Jauhininen, et al. | 0.0466 | 0.0423 | 0.0509 |
| L Ali, et al. | 0.0467 | 0.0424 | 0.0510 |
| Xinmeng Men, et al. | 0.0467 | 0.0424 | 0.0510 |
| Wenkui Lin, et al. | 0.0471 | 0.0428 | 0.0514 |
| Yu Wang, et al. | 0.0470 | 0.0427 | 0.0513 |
| Sadie Khwaja, et al. | 0.0467 | 0.0424 | 0.0510 |
| **Combined** | **0.0467** | **0.0424** | **0.0510** |

**Appendix 6.** The Funnel plot of included studies for examining publication bias.



The spots represented included studies which reported the reimplantation rate, and were orientated by the reimplantation rate (the X axis)

and the standard error of the reimplantation rate (the Y axis). The red line means the synthesized rate of cochlear reimplantation.