**Supplemental Table S1: Comparisons of Characteristics of Tweets Across Different Stakeholder Types.** (data presented as frequency, or median with 25-75% IQR)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Clinician**  **(n=14)** | **HCO**  **(n=49)** | **Individual**  **(n=20)** | **Org Non-Health**  **(n=16)** |
| **Characteristics of Stakeholders Tweeting** |  |  |  |  |
| **Verified** | 57% (n=8) | 92% (n=45) | 25% (n=5) | 56% (n=9) |
| **Followers** | 15,217 (15,217-29,850) | 41,255 (14,241-4,641,510) | 75,475 (11,501-134,621) | 21,040 (7,241-481,353) |
| **Following** | 660 (608-9,207) | 7,727 (2,093-7,727) | 2,830 (937-7,022) | 339 (126-1,227) |
| **Followers/Following Ratio** | 23 (3-23) | 5 (5-10) | 8 (2-27) | 162 (42-339) |
| **Tweet Characteristics** |  |  |  |  |
| **Type of Tweet** |  |  |  |  |
| **Education Tweet** | 57% (n=8) | 86% (n=42) | 25% (n=5) | 44% (n=7) |
| **Research Tweet** | 21% (n=3) | 2% (n=1) | 10% (n=2) | 31% (n=5) |
| **Political Tweet** | 7% (n=1) | 2% (n=1) | 40% (n=8) | 0% (n=0) |
| **Promotional Tweet** | 14% (n=2) | 10% (n=5) | 15% (n=3) | 25% (n=4) |
| **Personal Tweet** | 0% (n=0) | 0% (n=0) | 10% (n=2) | 0% (n=0) |
| **Tweet Part of a Thread** | 14% (n=2) | 16% (n=8) | 25% (n=5) | 0% (n=0) |
| **Tweet Contains Image** | 36% (n=5) | 76% (n=37) | 25% (n=5) | 63% (n=10) |
| **Image Tags Users** | 0% (n=0/5) | 16% (n=6/37) | 0% (n=0/5) | 10% (n=1/10) |
| **Tweet Contains GIF/Video** | 0% (n=0) | 24% (n=12) | 20% (n=4) | 19% (n=3) |
| **Contains Other Hashtags** | 86% (n=12) | 76% (n=37) | 100% (n=20) | 69% (n=11) |
| **Median Number of Hashtags** | 2 (1-10) | 1 (1-3) | 2 (1-3) | 2 (1-4) |
| **Tweet Contains Mentions** | 50% (n=7) | 82% (n=40) | 50% (n=10) | 88% (n=14) |
| **Median Number of Mentions** | 4 (1-5) | 1 (1-1) | 2 (1-3) | 1 (1-2) |
| **Tweet Contains Link?** | 50% (n=7) | 82% (n=40) | 50% (n=10) | 88% (n=14) |
| **Link Contains Video?** | 0% (n=0) | 48% (n=19) | 20% (n=2) | 7% (n=1) |
| **Type of Link?** |  |  |  |  |
| **Gen Education Link** | 57% (n=4/7) | 93% (n=37/40) | 20% (n=2/10) | 29% (n=4/14) |
| **Research Ed Link** | 43% (n=3/7) | 3% (n=1/40) | 30% (n=3/10) | 43% (n=6/14) |
| **Political Link** | 0% (n=0/7) | 0% (n=0/40) | 30% (n=3/10) | 0% (n=0/14) |
| **Promotional Link** | 0% (n=0/7) | 5% (n=2/40) | 20% (n=2/10) | 29% (n=4/14) |

**Supplemental Table S2: Qualities of Top 50 Links Related to #asthma in 2018 by Quality of Link** **According to the HONCode Score**. (data presented as frequency, or median with 25-75% IQR)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **High HONCode**  **(n=17)** | **Medium or Low HONCode**  **(n=33)** | **p-value (OR)** |
| **Type of Link** |  |  |  |
| **General Education** | 47% (n=8/17) | 39% (n=13/33) | 0.76 |
| **Research Article** | 41% (n=7/17) | 15% (n=5/33) | 0.08 |
| **Promotional** | 0% (n=0/17) | 33% (n=11/33) | 0.009 |
| **Political** | 12% (n=2/17) | 12% (n=4/33) | 1.00 |
| **Host of Site** |  |  |  |
| **Healthcare Organization** | 59% (n=10/17) | 30% (n=10/33) | 0.0457 |
| **News Media** | 41% (n=7/17) | 36% (n=12/33) |  |
| **Other Org/Business** | 0% (n=0/17) | 27% (n=9/33) |  |
| **Industry** | 0% (n=0/17) | 6% (n=2/33) |  |
| **Provides Useful Info** | 71% (n=12/17) | 45% (n=15/33) | 0.14 |
| **Asthma Content Score** | 6 (3-12) | 3 (0-5) | 0.01 |
| **High Asthma Content Score** | 53% (n=9/17) | 27% (n=9/33) | 0.12 |
| **HONCode Score** | 7 (6-7) | 4 (3-5) | <0.0001 |
| **DISCERN Score** |  |  |  |
| **Reliability** | 30 (27-36) | 23 (18-28) | <0.0001 |
| **Quality** | 16 (8-25) | 10 (7-12) | 0.01 |
| **Overall** | 4 (2-4) | 2 (1-3) | 0.007 |
| **High Overall DISCERN** | 29% (n=5/17) | 6% (n=2/33) | 0.04 (OR 6.5; 95% CI 1.1-37.9) |
| **Low Overall DISCERN** | 29% (n=5/17) | 67% (n=22/33) | 0.02 (OR 0.2; 95% CI 0.06-0.74) |

**Supplemental Table S3: Qualities of Top 50 Links Related to #asthma in 2018 by Quality of Link** **According to the DISCERN Score.** (data presented as frequency, or median with 25-75% IQR)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **High DISCERN**  **(n=7)** | **Low DISCERN**  **(n=7)** | **p-value (OR)** |
| **Type of Link** |  |  |  |
| **General Education** | 86% (n=6/7) | 26% (n=7/27) | 0.007 (OR 17.1; 95% CI 1.7-168.4) |
| **Research Article** | 14% (n=1/7) | 22% (n=6/27) | 1.00 |
| **Promotional** | 0% (n=0/7) | 33% (n=9/27) | 0.15 |
| **Political** | 0% (n=0/7) | 19% (n=5/27) | 0.56 |
| **Host of Site** |  |  |  |
| **Healthcare Organization** | 71% (n=5/7) | 30% (n=8/27) | 0.17 |
| **News Media** | 29% (n=2/7) | 37% (n=10/27) |  |
| **Other Org/Business** | 0% (n=0/7) | 30% (n=8/27) |  |
| **Industry** | 0% (n=0/7) | 4% (n=1/27) |  |
| **Provides Useful Info?** | 100% (n=7/7) | 11% (n=3/27) | <0.0001 |
| **Asthma Content Score** | 11 (10-17) | 2 (0-3) | 0.003 |
| **High Asthma Content Score** | 100% (n=7/7) | 11% (n=3/27) | <0.0001 |
| **HONCode Score** | 6 (6-8) | 4 (3-6) | 0.003 |
| **High HONCode Score** | 71% (n=5/7) | 19% (n=5/27) | 0.01 |
| **DISCERN Score** |  |  |  |
| **Reliability** | 34 (30-27) | 21 (17-26) | <0.0001 |
| **Quality** | 24 (19-28) | 7 (7-10) | <0.0001 |
| **Overall** | 4 (4-5) | 1 (1-2) | <0.0001 |

**Supplemental Table S4: HONCode Scoring Criteria.** One point given for each principle met. Points summed to give total score. Scoring: Low = satisfying 0 to <3 principles; Medium = satisfying 3 to <6 principles; High = satisfying 6-8 principles.

|  |  |
| --- | --- |
|  | **HONCode Principle** |
|  | 1. Any medical or health advice given in the video must come from a qualified health professional unless it is clearly stated that the information does not come from a qualified health source. |
|  | 2. The information provided in the video must be designed to support the patient’s asthma self-management, but it is not meant to replace the patient-physician relationship. |
|  | 3. The information in the video maintains the right to confidentiality and respect of the individual patient featured. |
|  | 4. Each video contains references to source data on information presented or contains a specific HTML link to source information. |
|  | 5. Each video containing claims on the benefits or performance of specific skills/behaviors, interventions, treatments, products, etc., must be supported by evidence through references or HTML links. |
|  | 6. The video must provide the viewer with contact information, or a URL to more information. |
|  | 7. Any individual or organization that contributes funds, services or material in the posted video must be clearly identified in the video or video description. |
|  | 8. If advertisement supports funding to the video or the video’s developers, it must be clearly stated. Included advertising must be clearly differentiable to the viewer: There should be a clear difference between the advertising material and the educational material in the video. |

**Supplemental Table S5: DISCERN Questionnaire.** Section 3 Rating: Low = Serious or extensive shortcomings; Moderate = Potentially important, but not serious shortcomings; High = Minimal shortcomings

|  |  |
| --- | --- |
| **Section 1 – Is the publication reliable?** | |
| 1. Are the aims clear? | No Partially Yes  1 2 3 4 5 |
| 2. Does it achieve its aims? | No Partially Yes  1 2 3 4 5 |
| 3. Is it relevant? | No Partially Yes  1 2 3 4 5 |
| 4. Is it clear what sources of information were used to compile the publication (other than the author or producer)? | No Partially Yes  1 2 3 4 5 |
| 5. Is it clear when the information used or reported in the publication was produced? | No Partially Yes  1 2 3 4 5 |
| 6. Is it balanced and unbiased? | No Partially Yes  1 2 3 4 5 |
| 7. Does it provide details of additional sources of support and information? | No Partially Yes  1 2 3 4 5 |
| 8. Does it refer to areas of uncertainty? | No Partially Yes  1 2 3 4 5 |
| **Section 2 – How good is the quality of information on treatment choices?** | |
| 9. Does it describe how each treatment works? | No Partially Yes  1 2 3 4 5 |
| 10. Does it describe the benefits of each treatment? | No Partially Yes  1 2 3 4 5 |
| 11. Does it describe the risks of each treatment? | No Partially Yes  1 2 3 4 5 |
| 12. Does it describe what would happen if no treatment is used? | No Partially Yes  1 2 3 4 5 |
| 13. Does it describe how the treatment choices affect overall quality of life? | No Partially Yes  1 2 3 4 5 |
| 14. Is it clear that there may be more than one possible treatment choice? | No Partially Yes  1 2 3 4 5 |
| 15. Does it provide support for shared decision-making? | No Partially Yes  1 2 3 4 5 |
| **Section 3 – Overall rating of the publication.** | |
| 16. Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices. | Low Moderate High  1 2 3 4 5 |

**Supplemental Table S6: Asthma Content Score Criteria.** If Criteria addressed = 1 point, partially addressed = 0.5 points, not addressed = 0 points

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Score** | **Criteria** | **Examples** |
| **Definition** |  | Chronic Disease | Chronic |
|  | Inflammatory Disease | Neutrophils, Eosinophils, Lymphocytes, Mast cells |
|  | Recurrent | Recurrent, recurrence |
|  | Airways Disease | Airway hyperresponsiveness, Airway remodeling |
| **Signs/Symptoms** |  | Bronchoconstriction | Wheezing, Airway narrowing |
|  | Cough | Cough |
|  | Shortness of breath | Shortness of breath, dyspnea |
| **Risk Factors** |  | Triggers | Allergens, Viruses |
|  | Atopy | Atopy, Eczema, Allergies, Hayfever, Allergic Rhinitis |
|  | Family History | Gene-Environment Interactions |
| **Evaluation** |  | Pulmonary Function Testing | Spirometry |
|  | Allergy Testing | Allergy Testing |
| **Management** |  | Rescue Medications | Albuterol |
|  | Controller Medications | Corticosteroids, LABA |
|  | Asthma Action Plan | Asthma Action Plan |
| **Outcomes** |  | Asthma Control | Control |
|  | Acute exacerbations | Attacks, exacerbations |