

Leveraging GovDelivery for MedlinePlus Email Campaigns and Outreach

Tyler Moses

National Library of Medicine Associate Fellow

Date of Submission: August 24, 2017

Project Sponsors: Katherine Masterton and Katie Chan

Acknowledgements

This project would not have been possible without the support received from the Project Team, Katie Chan, Kate Masterton, Fedora Braverman, Stacy Coppess, and Ekaterina Eby. Also, thanks are given to those who assisted in the hallway usability test, Alla Vysokolova, for creating the email layouts, and Joanna Widzer for her advice and assistance in conducting the test itself. The Associate Fellow thanks those who took the time out of their schedule to be interviewed and taught her about email marketing at their institutions as well as email marketing best practices. Special thanks are given to the Associate Fellow's mentors, Lisa Boyd and Wanda Whitney, for supporting her throughout the project. Additionally, the Associate Fellow wants to thank Dianne Babski, Joyce Backus, Jerry Sheehan, and Dr. Patricia Flatley Brennan for their support of the Associate Fellowship Program. Lastly, the Associate Fellow wants to thank Kathel Dunn, the Coordinator of the Associate Fellowship Program, and the 2016-2017 Associate Fellows, Megan Fratta, Kendra Godwin, and Candace Norton, for providing encouragement and creative ideas on how to make a better email.

Table of Contents

Acknowledgements	2
Abstract	4
Background	4
Methods	4
Results	4
Conclusions	4
Introduction	5
Methodology/Procedures	6
Email Marketing Education	6
Email Bulletin Creation and Dissemination	7
Hallway Usability Testing	8
Results	8
Outcomes from Email Bulletins	8
Results from the Hallway Usability Testing	10
Discussion	11
Information Acquired from Email Marketing Resources	11
Best Practices for Email	11
Limitations	12
Recommendations	13
Bibliography	17
Appendix A: A Table of the Individuals Interviewed Regarding Email Marketing Strategies	19
Appendix B: Hallway Testing Script and Notes	20
Appendix C: Two Panel Newsletter Layout	26
Appendix D: Five Panel Newsletter Layout	27
Appendix E: Customized Email with a Blue Banner Layout	28
Appendix F: Customized Email without Blue Banner Layout	29
Appendix G: Comparison of HubSpot, Granicus, and MailChimp	30

Abstract

Background

As a health information website, MedlinePlus provides information on an array of health topics, such as diabetes and aspirin, to the public. Between MedlinePlus and its sister site, MedlinePlus en Español, there are 83,700,000 email subscriptions that receive email updates on their health topics of interest. Though a large volume of emails is sent to subscribers, the links within are seldom clicked on. The Project Sponsors wanted to identify potential email marketing strategies to engage more subscribers with MedlinePlus emails.

Methods

Through learning opportunities, such as webinars and interviews with staff from federal agencies that participate in email marketing, the Associate Fellow applied the knowledge acquired to create customized emails that were sent to several health topic subscriber groups; the data from GovDelivery and Google Analytics were utilized to identify which elements of the emails attracted subscribers. This information was compiled to design two types of email layouts (newsletter and customized email) that were used in a hallway usability test to acquire real time feedback on email elements the participants liked.

Results

Data from these tests illustrated that subscribers prefer emails with large font, to feature images relevant to them, and have colorful designs. Subscribers are more likely to open emails with statement subject headings. In addition, subscribers are more likely to engage with emails if there is a clear call to action and if there are noticeable links that lead to new information. Furthermore, subscribers feel that the customized emails should contain less information while newsletters should feature a variety of new stories.

Conclusions

The elements that have been identified from these experiments should be incorporated into future emails to better engage subscribers. More tests should be done to further identify other elements (i.e. time of day sent, day of the week, etc.) that could help make MedlinePlus email marketing more effective.

Introduction

MedlinePlus is a consumer health information website produced by the National Library of Medicine (NLM). The site provides a range of health information on medical topics and conditions (e.g. tanning and osteoporosis) as well as drugs and supplements (e.g. aspirin and cod liver oil). MedlinePlus users can subscribe to receive email notifications when an update on the website pertaining to their health topic of interest occurs. To date, there are 930,000 subscribers between both the English and the Spanish versions of MedlinePlus; among those subscribers, there are 83,700,000 email subscriptions for both MedlinePlus and MedlinePlus en Español. The emails are delivered to subscribers through GovDelivery, an electronic communication system provided by Granicus that assists government institutions in reaching the public through various mediums such as email or text messages (Granicus, 2017b). For MedlinePlus, these emails are typically automatically generated and contain a hyperlinked text with an image and/or a brief description. Despite the large number of subscribers and the frequency in which the emails are sent, a small percentage of these emails are opened and few of the links within the emails are clicked on.

The goal of the Spring 2017 project, "Leveraging GovDelivery for MedlinePlus email campaigns and outreach" was to see whether customizing the emails increases the number of subscribers who open the emails as well as the volume of online traffic to MedlinePlus from subscribers clicking on the links in the email. The objectives to achieve such a goal include:

- Becoming familiar with the GovDelivery email system and assessing how it is currently used by MedlinePlus staff as well as the different features that have not been optimized;
- Exploring GovDelivery analytics and identifying opportunities for potential growth;
- Proposing different approaches for the enhanced emails, and approaches for metrics;
- Creating and sending emails with new formats and content and;
- Analyzing effectiveness of various techniques, using data collected by GovDelivery but also by utilizing URL parameters to look at the Google Analytics data, segmenting users who visited the site from GovDelivery.

Another objective that was later included was to construct a process that would lead to the project being replicated upon the conclusion of the Associate Fellow's participation.

The project was conducted by Katherine (Kate) Masterton (project sponsor), Katie Chan (project sponsor and GovDelivery troubleshooter), and Tyler Moses (National Library of Medicine Associate Fellow) with Fedora Braverman (Spanish translation expert), Stacy Coppess (MedlinePlus social media and marketing consultant), and Ekaterina (Kate) Eby (digital analytics consultant) serving as the main resource people.

Much of the research literature highlights the benefits of health professionals using email to connect patients with their medical records to make patients more informed as well as engaged in their medical care. However, emails also serve as an excellent method to connect patients with quality consumer health information (Atherton, Huckvale, & Car, 2010). Email enables patients to access information on their own time and save the information for future reference; in addition, sending health information directly to patients decreases the amount of time they spend looking for credible health information (Atherton, Huckvale, & Car, 2010).

In marketing, emails with lackluster designs often deter people from clicking on the links within the body of the content (Rowe & Burridge, 2010). Some techniques that are believed to make emails more engaging are (Rowe & Burridge, 2010):

- Using color and icons to:
 - Direct subscribers to navigation tools and
 - Make them visually appealing.
- Creating interesting original content with a strong call to action (a message that compels people to do something).

Though these strategies are more applicable for emails that advertise products, these same design tools can be applied to MedlinePlus' emails to increase engagement among subscribers by persuading them to click on the links within the emails.

Methodology/Procedures

The project was divided in to four phases:

1. Email marketing education
2. Email bulletin creation and dissemination
3. Testing variables
4. Hallway usability study

Email Marketing Education

Throughout March 2017, the Associate Fellow conducted research on email marketing and interviewed eleven individuals from both NLM and other institutions, such as the National Institute on Aging and the Food and Drug Administration to gauge their experience with GovDelivery, email marketing, and what facets within an email are engaging to them personally as well as their subscribers. See Appendix A for a list of individuals whom were interviewed.

Along with the interviews, the Associate Fellow attended the Granicus Digital Communications Summit in Washington D.C. on April 13, 2017. The conference focused on the diverse features the platform offers to engage users as well as what tools can be utilized to determine how well an institution is connecting with its users. The Associate Fellow also took online email marketing and Google Analytics courses on Lynda.com as well as read diverse email marketing pamphlets produced by Granicus.

Email Bulletin Creation and Dissemination

Prior to creating any email bulletins, the Associate Fellow met with the Project Team to design a process on how the emails would be created and which websites could be used as resources; to familiarize herself with the features in GovDelivery, the Associate Fellow looked at the “MedlinePlus GovD Home” pages from the NLM wiki page on the Confluence platform. The deadlines for the work process were documented on pages of a calendar from March 2017 through July 2017. The Associate Fellow was granted access to both the Spanish and English GovDelivery accounts to compose and send out emails; she was also given access to MedlinePlus’ Google Analytics account to analyze the data from the links in the email bulletins.

To effectively identify what changes in an email were engaging to users, the Project Team and Associate Fellow decided to do A/B testing with the emails. A/B testing is a method in which subscribers are divided into two groups and both receive the same email with only one small difference (the variable) between them (e.g. an email with an image and then another one without an image). Data, from either the email marketing services or Google Analytics, would be used to determine which change lead to more emails being open or more engagement with users (Duquet, 2016).

During meetings with the Project Team, they and the Associate Fellow selected which health topics would receive an email bulletin and what variable would be tested. The health topics chosen from March-June are as follows: Diabetes, Autism, Vitamin D and Ticks. Two emails with content tailored to the interests of the subscribers (customized emails) were created with only one variable changed. Then using the “Subscribers Added” criteria in GovDelivery, the subscriber list for each topic (and some related topics) was divided in half by the date in which a subscriber signed up to receive an email bulletin for a health topic; one email was sent to the first half of the group and the other email to the second half of the group to determine which version people responded to best.

Using the Google Analytics campaign builder, the Associate Fellow created urchin tracking module (UTM) codes for each link so Google Analytics could retrieve data on the activity from the webpage once the link has been clicked. A UTM code is code attached to a customized URL to capture data (e.g. number of users, bounce rate, time spent viewing a page, etc.) from an email or website (Launch Digital Marketing, 2012). Data collected from GovDelivery and Google Analytics were utilized to identify which variables were more engaging. The metrics used to assess engagement were:

- Unique open rate (GovDelivery): Rate in which an email was opened for the first time by a subscriber (Granicus, 2017c).
- Click rate/click-through rate (GovDelivery): Total number of times a link was clicked on in the email (Granicus, 2017c).

- Unique click rate (GovDelivery): Rate in which a link was clicked on for the first time by a subscriber (Granicus, 2017c).
- Bounce rate (Google Analytics): Rate in which a user viewed a page before leaving. The smaller the bounce rate, the longer a user was viewing a webpage (Granicus, 2017a).
- Users (Google Analytics): Number of people who visited a webpage (Batesole, 2017).
- New users (Google Analytics): Number of people who are viewing a webpage for the first time (Batesole, 2017).
- Average session duration (Google Analytics): Average number of interactions a user has on the website within a specific time frame (Goggle, 2017a; Google, 2017b).

The data informed what elements to include in the email designs produced for the hallway usability test. The data also supports best practices for future MedlinePlus email initiatives.

Hallway Usability Testing

On July 14, 2017, Tyler Moses, Katie Chan, Kate Masterton, and Joanna Widzer (Specialist Librarian who has experience in hallway usability tests) conducted a hallway usability test on the south side of the Clinical Center at the National Institutes of Health (NIH). Hallway usability testing is where researchers set up a booth in an area with a lot of foot traffic and ask bystanders to test and provide feedback on their product(s) (USAJOBS Team, 2014). For the project, participants were solicited to take two different tests where they were asked to look at two types of email layouts: a customized information on a specific topic (design with a blue banner versus design without blue banner) or a newsletter (2 storyboards versus 5 storyboards). Participants were tasked to look at the email layouts and provide feedback on which designs or features of a design they felt were engaging. The data would be utilized to construct possible email design templates that could be used for future email notifications from MedlinePlus. Participants were asked about the frequency of their email usage. To track the number of non-federal employees to stay under the Paperwork Reduction Act limit, participants were asked whether they were a federal employee and about their profession. Four email layouts were constructed and tested: three by Alla Vysokolova (E-Health Information Support Section at NLM) and one by Tyler Moses using an email design layout created prior to the project by an email marketing consultant at Granicus. See Appendix B for a copy of the script and the document used to record participants' feedback. Also, see Appendices C-F for copies of the email designs used during the test.

Results

Outcomes from Email Bulletins

Table 1 compares the GovDelivery's average open rate of the emails sent to subscribers before the project and those sent during the project.

Table 1: Average Open Rate of Emails Sent Before and During the Project

Granicus Accounts	Average Open Rate Prior to Project	Average Open Rate of Customized Emails
English	6.19%	6.33%
Spanish	5.65%	6.1%

The data illustrates a slight increase in how frequent the emails were opened before and during the project. However, there was no significant change in the click rate between the customized emails and the emails sent prior to the start of the project.

The vitamin D email illustrated a difference between the unique open rate for both the statement and question subject headings among the English (statement: 12% unique open rate; question: 7% unique open rate) and Spanish (statement: 8% unique open rate; question: 6% unique open rate) subscribers. There was no significant difference in the data among tick bite English subscribers who received an email with or without an image. However, tick bite Spanish subscribers who received an email with an image clicked on the link to a MedlinePlus' image of a tick on person only five times compared to sixteen times from those who received an email without an image.

Per the data gathered from GovDelivery, 37.5% of English subscribers who received the customized tick email clicked on the link to the new MedlinePlus article on the increase in the number of ticks during the summer. The data from Google Analytics shows that the bounce rate from the MedlinePlus Lyme disease page that was linked to the email was about 67% for Spanish subscribers compared to the 80% bounce rate for English subscribers. The data illustrated a difference in the level of engagement by health topics among Spanish and English users. For example, GovDelivery's unique open rate for English subscribers to diabetes complications was 4% while the unique open rate for Spanish subscribers was 8%. Furthermore, Google Analytics' bounce rate from the webpages attached to the diabetes email ranged from 22.22-50% among Spanish subscribers while the bounce rate for the same links ranged from 0-100% among English subscribers; Google Analytics showed that the average session durations (44-389.33 seconds) were higher for Spanish users compared to English users (0-214 seconds) for the same diabetes related links in the email.

The data also illustrated that new subscribers were more compelled to open emails compared to subscribers who have been receiving emails for a long period. See Table 2 for a comparison of the average open rate between English and Spanish subscribers slotted in the before (the group of individuals who subscribed to a health topic prior to a specific date) and after (the group of individuals who subscribed to a health topic after a specific date) groups for the tick email.

Table 2: Comparison of the Average Open Rates of the Before and After Groups of the Tick Email English and Spanish Subscribers

GovDelivery Subscriber Accounts	Average Open Rates of Before Group	Average Open Rates of After Group
English	3%	5%
Spanish	4%	5%

Only one email (insect bites and stings English subscribers in the before group) had the most clicks for the first link (Health Daily news article: 6 unique clicks).

Results from the Hallway Usability Testing

A total of 20 (13 participants for news and 7 participants for customized design on a specific topic) individuals participated in the hallway usability testing; four of the participants were federal employees and sixteen of the participants held other positions (e.g. interns, students, post doctorates, etc.). On average, the users spend about 36 hours a week viewing emails.

Similar elements were identified from all participants. Participants from both test groups felt that:

- Emails should contain relevant pictures (customized emails: 2 out of 7 people; news: 6 out of 13 people);
- Have a clear call to action (customized emails: 1 out of 7; news: 1 out of 13);
- Bigger font (customized emails: 3 out of 7; news: 2 out of 13) and;
- Designs should be colorful (customized emails: 2 out of 7; news: 1 out of 13).

Participants viewing the customized designs on a specific topic commented that they wanted less information (3 out of 7 participants) while those viewing the newsletter emails wanted more articles (6 out of 13 participants).

Overall, 10 participants preferred the five-panel newsletter while 5 participants were drawn to the two-panel design. For the customized email on a specific topic, four participants liked design without the blue banner but three participants favored the email with the blue banner. However, the customized email test may have been biased by the researchers. The design without the blue banner was printed from an email making the font bigger than the design with the blue banner; many of the participants commented that they selected the design without the blue banner because of the larger font.

Discussion

Information Acquired from Email Marketing Resources

The challenge in email marketing is engaging users and compelling them to go to an institution's website. For federal institutions, they face the additional challenge of competing for users' attention with private and non-profit institutions; for instance, a person, on average, receives about 100 email a day and they check their inbox at least 74 times (Wales, 2017). In an area where information derives from diverse groups, federal institutions need to learn how to approach their users in an effective manner.

One way to pique users' attention is to create a unique subject heading that contains either a question or an intriguing statement; however, the subject heading should not contain certain terms, such as "Free", that will cause it to be placed in the Spam folder (Saghafi, 2017). To further engage users, the content must align with the interests of the users while staying focused on the topic and being succinct (K. Blaine, personal communication, March 22, 2017). The content should contain several calls to action to compel users to explore additional information on the institution's website (Duquet, 2016).

While images are an excellent method to engage users, they should be used sparingly for some browsers block images from appearing within the body of the email (S. Dailey, personal communication, March 20, 2017). Furthermore, using links can be an excellent method to guide users to pertinent information but, the links need to stand out from the rest of the content (Saghafi, 2017). Also, the first link in the email should contain the most pertinent information that users need to know for about 89% of users click on only one link within an email (O'Phelan, 2014). It is also beneficial to organize content in the email from the mindset that it will be opened on a mobile device since many users open emails on their tablets or smartphones (Duquet, 2016).

Though there is an overlap in best practices for engaging with individuals through email, these elements are subjective for each institution due to the diversity of their audience (Duquet, 2016). To determine which elements are appropriate for users, institutions need to be willing to experiment with their emails to identify what works for engaging their users. Lastly, institutions need to define what success looks like for their email campaign and select the metrics, such as open rate (percentage of total number of people who opened the email) and click-through rate, that will be able to capture that data; by establishing what makes a successful email campaign, institutions can uncover whether they effectively engaged with users (Duquet, 2016).

Best Practices for Email

The data from both the email campaign and the hallway usability testing highlighted the elements subscribers find engaging in an email. For instance, subscribers were more likely to open emails with a statement subject heading

versus those with a question. While English subscribers did not exhibit any change in engagement if the email contained an image, Spanish subscribers were more inclined to click on links if the email lacked an image. Spanish users are more inclined to select links that directed them to images and/or quantifiable information (e.g. intake of vitamin, testing measurements, etc.); English subscribers are geared towards links that yield timely information, like news articles, that pertain to their health interests. As seen from the data, there is a deviation between Spanish and English subscribers as to what health topics they find interesting. Contrary to the published literature and information acquired from the interviews, subscribers tend to click on links that lead to content relevant to their interests instead of the first link. Overall, subscribers tend to stay longer on webpages that contain information that they have not seen before. The data seen from the hallway usability testing suggests subscribers prefer emails to have a clear call to action, larger font, colorful designs, and images that are relatable to them. Also, email subscribers want to receive email newsletters with a variety of news stories but want customized emails with more succinct, topic-oriented content.

The information acquired from these tests should be incorporated into future emails disseminated from MedlinePlus. Due to the divergence of interest in health topics between English and Spanish subscribers, members from the MedlinePlus team should utilize Google Analytics data to identify the most popular health topics among both groups and create emails pertaining to those topics; in addition, the content within the emails should predominately focus on new information to engage subscribers who have been receiving email notices for a long time. For emails being dispersed to Spanish subscribers, there should be a mix of links that guide users towards visuals and information with values (e.g. number of calories consumed, etc.). These changes could not only lead to higher open rates from current subscribers, it could also increase the volume of subscribers that frequent MedlinePlus as well as the time spent reading the content on the webpages; furthermore, it could possibly lead to more subscriptions to MedlinePlus if users are circulating their emails to other individuals.

Limitations

The data pulled from the links in Google Analytics does not always reflect how the groups are divided in GovDelivery. Google Analytics groups the email campaign data together by the UTM code assigned to the links. This grouping of data prohibits researchers from conducting an in-depth analysis of the data based on the segmented groups. The challenge is to devise a method where the division of the subscribers in GovDelivery can be reflected in Google Analytics while negating the bias that newer subscribers are more inclined to open emails.

Another limitation is the time in which it takes to create a customized email in Granicus; the glitches in the system (inability to sometimes resize or move images, resetting to default formats when inserting bullets, etc.) can extend the time it takes to design an email. Also, the create and review process for an email takes about a month. Adjustments should be made to the process if more emails

are to be produced within a single month; one adjustment could be selecting the health topics to receive an email at least one week before the completion of the current email bulletin. Lastly, having to rely on GovDelivery and Google Analytics to collect the necessary variables leads to some of the data being lost between the two systems for they utilize diverse metrics to analyze and organize the data.

Recommendations

To ensure the continuity of the project, here are the various phases that individuals coming onto the project should explore:

Table 3: The Phases to Explore for the Email Campaign Project

Phase	Task	Additional Details
Phase One: Education and Training	Take courses in Lynda.com.	Name of courses: <ul style="list-style-type: none"> • Email Marketing; • Google Analytics and; • 508 Compliance.
	Watch Viemo training videos.	Videos to watch: <ul style="list-style-type: none"> • GovDelivery Basic Bulletin Editor; • Creating an Advanced Bulletin Template and; • Sending an Advanced Bulletin.
	Review material collected from the GovDelivery project (uploaded in to the 2016-2017 Associate Fellow's report folder in Sharepoint).	Materials include: <ul style="list-style-type: none"> • Interview notes and; • Granicus documents.
	Review MedlinePlus wiki page on creating content.	Topics to pay attention to: <ul style="list-style-type: none"> • MedlinePlus GovD Home and; • Spanish Procedures.
	Explore MedlinePlus' accounts for GovDelivery and Google Analytics.	Permissions to use the accounts will be given from the MedlinePlus team.
	If doing A/B testing, review material on A/B testing.	Online resources: <ul style="list-style-type: none"> • Intro to A/B testing • Diving Deeper into A/B testing: 30 Tests to Drive Engagement Look at the 2016-2017 Associate Fellow reports page on Sharepoint for additional A/B testing material from Granicus.
Phase Two: Creation of Emails	Select topic ideas.	Methods/Resources to select health topics: <ul style="list-style-type: none"> • National Health observances; • Seasonally relevant health topics;

Phase	Task	Additional Details
		<ul style="list-style-type: none"> • Topic Category Report created from GovDelivery and; • Looking at the Site content data (under the Behavior category) from Google Analytics to determine which MedlinePlus pages are being viewed.
	Establish deadlines for when portions of the email should be completed.	Can use the calendar format in Word.
	Research selected topic.	Use MedlinePlus and other federal institutes' websites as sources for information.
	Outline and create the email bulletin in Word.	Set up the content as it would appear in an email.
	Review and revise content.	Repeat this step as much as necessary.
	Code any email links in the email using the Google Email Campaign tool .	This will help track electronic traffic in Google Analytics.
	Type in content and insert coded hyperlinks into a new email bulletin in GovDelivery under the appropriate health subscriber group.	If the email is going to multiple subscriber groups, copies of the email must be created and the subscriber list changed in the "To" section of the email bulletin.
Phase Three: Distribution of Email	If doing A/B testing, select which variable to test.	Can be anything from image/no image, links/no links, etc. However, only one variable should be tested at a time.
	Make two copies of the email bulletin with the appropriate changes to the variable.	No additional details needed.
	Divide the number of subscribers by 2 to yield.	This information yield the number of subscribers that make up half the list.
	Click on the "Subscribers Added" option in the criteria filter.	No additional details needed.

Phase	Task	Additional Details
	Using the "Before" and "After" option, select the date where the number of subscriber list matches half of the subscribers on the list.	The number of subscribers will automatically change as the dates are changed.
	Determine which email will go to the Before and After groups.	No additional details needed.
	Click the "Send Test" option at the bottom to receive a draft version of the email.	A test copy of the email will be sent to editor of the email's inbox. This will allow the editor, and other selected users, to see the email as it will appear in the subscribers' inbox.
	Make any last-minute correction to the email bulletins in GovDelivery.	No additional details needed.
	Send out emails to subscribers	Click on the "Send Test" at the bottom of the email bulletin and then click "OK" button on the message that appears.
Phase 4: Data Collection	Review the data reports generated through GovDelivery.	Look to see if there are any noticeable differences in the reports especially the open rate, click rate, and the number of unique clicks for the links.
	Look at the Campaign data in Google Analytics.	The data will provide an in-depth analysis of the Internet traffic to the coded URLs.
	Look at the Site data in Google Analytics for the Internet traffic data on the MedlinePlus webpages that were used in the email.	Compared with the campaign data from the email bulletin, this will give an idea as to whether the emails lead to more engagement for the webpages.
	Compare all the data together.	Will help to identify whether there is an increase in engagement with the content and identify which variable engaged the subscribers more.

In addition, it would be beneficial to do additional A/B testing to determine what other variables (e.g. time of day, day of the week, etc.) could lead to an increase in engagement. The data from these tests, along with the data from the hallway

usability testing and the customized emails, can be used to create an email design using the elements that were found to be engaging.

While not essential for the continuity of the project, it may be useful to compare the different functionalities of other email distribution products, such as MailChimp and Hubspot, widely used by other federal agencies. This comparison can help determine which product offers the best features and services to meet MedlinePlus' goals of engaging their email subscribers; a brief comparison of these products can be found in Appendix G.

Bibliography

- Atherton H, Huckvale C, Car J. Communicating health promotion and disease prevention information to patients via email: a review. *J Telemed Telecare* [Internet]. 2010 May 28 [cited 2017 Jul 1]; 16(4):172-5. Available from: <http://journals.sagepub.com/doi/pdf/10.1258/jtt.2010.004002>.
- Batesole B. Google Analytics Essential Training [Internet]. Santa Barbara (CA): Lynda.com; 2017 April 28 [cited 2017 Aug 4]; Available from: <https://www.lynda.com/MailChimp-tutorials/Optimizing-Marketing-Emails/433519-2.html>.
- Duquet M. Optimizing Marketing Emails [Internet]. Vancouver (BC): Lynda.com; 2016 April 7 [cited 2017 Jul 20]; Available from: <https://www.lynda.com/MailChimp-tutorials/Optimizing-Marketing-Emails/433519-2.html>.
- Google. How a web session is defined in Analytics [Internet]. [place unknown]: Google, Google Analytics; c2017 (a) [cited 2017 Jul 31]; Available from: <https://support.google.com/analytics/answer/2731565?hl=en>.
- Google. Session Duration, Avg [Internet]. [place unknown]: Google, Google Analytics; c2017 (b) [cited 2017 Jul 31]; Available from: <https://support.google.com/analytics/answer/2731565?hl=en>.
- Granicus. A Guide to Content Marketing for the Public Sector. [place unknown]: Granicus; 2017 (a). 20 p.
- Granicus. About Us: The largest cloud solutions provider for government [Internet]. Denver (CO): Granicus; c2017 (b) [cited 2017 Jul 1]; Available from: <https://granicus.com/about-us/>.
- Granicus. Bulletin Analytics Report [Internet]. Denver (CO): Granicus; c2017 (c) [cited 2017 Aug 4]; Available from: https://insights.govdelivery.com/Communications/CommunicationsCloud/Sending_Messages/Using_Reports_to_Track_Communication_Effectiveness/Bulletin_Analytics_Report.
- HubSpot. HubSpot Software: Pricing Packages [Internet]. [place unknown]: HubSpot; c2017 [cited 2017 Jul 31]; Available from: <https://www.hubspot.com/pricing/marketing#?currency=USD>.
- Launch Digital Marketing Campaign [Internet]. Naperville (IL): Launch Digital Marketing Campaign; 2012 Sept 26 [cited 2017 Aug 17]; Available from: <https://www.launchdigitalmarketing.com/what-are-utm-codes/>.
- MailChimp. MailChimp Pro: The only marketing platform with true Multivariate Testing [Internet]. Atlanta (GA): The Rocket Science Group, MailChimp; c2001-

2017 (a) [cited 2017 Jul 31]; Available from:
<https://mailchimp.com/features/multivariate-testing/>.

MailChimp. Pricing: Pro Marketer [Internet]. Atlanta (GA): The Rocket Science Group, MailChimp; c2001-2017 (b) [cited 2017 Jul 31]; Available from:
<https://mailchimp.com/pricing/pro-marketer/>.

Moses, Tyler (Library of Operations Division, National Library of Medicine, Bethesda, MD). Conversation with: Karla Blaine (Public Relations and Communications Office, National Center for Complementary and Integrative Health, Bethesda, MD). 2017 Mar 22.

Moses, Tyler (Library of Operations Division, National Library of Medicine, Bethesda, MD). Conversation with: Stephanie Dailey (Office of Communications and Public Liaison, National Institute of Aging, Bethesda, MD). 2017 Mar 20.

O'Phelan M. 3 Steps to Awesome Email Design [Internet]. Denver (CO): Granicus; 2014 May 21 [cited 2017 Jul 20]; Available from:
<https://granicus.com/blog/uncategorized/3-steps-to-awesome-email-design/>.

Rowe A, Burrige L. Ten inbox secrets: What eye tracking reveals about designing better emails. *J Direct, Data Digital Marketing Practice* [Internet]. 2012 Aug 13 [cited 2017 Jul 1]; 14(1):46-65. Available from:
<https://link.springer.com/content/pdf/10.1057%2Fdddmp.2012.23.pdf>.

Saghafi, Michelle. RE: Email Design Policies for Engaging Consumers [Internet]. Message to: Tyler Moses. 2017 Mar 29 [cited 2017 Jul 20]. [4 bullets].

USAJOBS Team. 10 Tips for Better Hallway Usability Testing [Internet]. Washington D.C.: U.S. General Services Administration (US), Office of Products and Programs, Technology Transformation Service; 2014 Feb 19 [cited 2017 Jul 1]; Available from
<https://www.digitalgov.gov/2014/02/19/10-tips-for-better-hallway-usability-testing/>.

Wales VB. Email Marketing: A/B Testing [slide]. Washington D.C.: U.S. General Services Administration (US), Technology Transformation Service; 2017 May 31. 33 slides: color.

Appendix A: A Table of the Individuals Interviewed Regarding Email Marketing Strategies

Table 4: Individuals Interviewed Regarding Email Marketing Strategies

Name	Office/Division/Title	Institution
Kathleen Cravedi	Director of the Office of Communications and Public Liaison (OCPL)	National Library of Medicine (NLM)
Melanie Modlin	Deputy Director of the OCPL	NLM
Mary Ann Leonard	Public Affairs Specialist	NLM
Wanda Whitney	Reference and Web Services Division	NLM
Brooke Dine	Reference and Web Services Division	NLM
Irene Liu	Public Liaison Officer	National Center for Complementary and Integrative Health (NCCIH)
Karla Blaine	Public Relations and Communications Office	NCCIH
Stephanie Dailey	Director of the Office of Communications and Public Liaison	National Institute on Aging
Victoria Donnelly	Management/Program Analyst	Food and Drug Administration (FDA)
Michelle Saghafi	Public Affairs Specialist	FDA
Joshlyn Ross	Digital Marketing & Social Media Strategist	Bixal

Appendix B: Hallway Testing Script and Notes

Hi, may I ask you what's your name?

My name is _____ and I'm from the National Library of Medicine. Do you have 10 minutes to share your opinions on some email layouts with us?

Great! We're asking people to give their feedback on a few email designs from NLM's health information website for the public, MedlinePlus, to find out which design people like the most.

As you compare the two designs, I'm going to ask you to try to think out loud as much as possible: to say what you're looking at and what you're thinking. This will be a big help to us in terms of understanding your experience.

Also, please don't worry that you're going to hurt our feelings. We're doing this to improve the appearance of our emails, so we need to hear your honest reactions. Any comments about the designs are welcome.

If you have any questions, just ask them. I'll answer them immediately if I can, or after the test. And if you need to take a break at any point, just let me know.

Do you have any questions so far?

OK. Before we look at the designs, I'd like to ask you just a few quick questions.

Test Variables A and B

Participant # _____

Introduction Questions

1. What do you do for a living? What keeps you busy?
2. Are you a federal employee?
3. Now, roughly how many hours a week would you say you spend looking through email, at work and at home?
4. Do you subscribe to email listservs to receive health information from websites?
5. Have you looked at the MedlinePlus website before?

Testing Session (Testing less than 10 participants)

OK, great. We're done with the questions, and we can start looking at things.

1. What do you think about the email designs?
2. Are they something you would like to receive in your inbox?
3. Of the two designs, which design do you like the best and why?
4. If you saw this design in your inbox, what would be the first thing you'd want to do and why?

Test Variables C and D

Participant # _____

Introduction Questions

1. What do you do for a living? What keeps you busy?
2. Are you a federal employee?
3. Now, roughly how many hours a week would you say you spend looking through email, at work and at home?
4. Do you subscribe to email listservs to receive health information from websites?
5. Have you looked at the MedlinePlus website before?

Testing Session (Testing less than 10 participants)

OK, great. We're done with the questions, and we can start looking at things.

1. What do you think about the email designs?
2. Are they something you would like to receive in your inbox?
3. Of the two designs, which design do you like the best and why?
4. If you saw this design in your inbox, what would be the first thing you'd want to do and why?

END TEST PORTION

Thanks, that was very helpful.

Do you have any questions for me, now that we're done?

Thank you so much for your help today. Your comments will help us create better email notifications.

Appendix C: Two Panel Newsletter Layout



HEALTH NEWS

05/23/2017 07:00 PM EDT

Getting Kids in the Habit of Healthy Eating

Try making good food fun at home

Want to help your kids make healthy food choices when you're not with them? Make every meal at home a lesson in good nutrition.

Start by showing them what goes into a healthy meal, ChooseMyPlate.gov from the U.S. Department of Agriculture suggests. Fill half their plate with fruits and veggies, one quarter with grains – preferably whole grains – and a quarter with protein, like lean meat, seafood, beans or tofu. Then let them practice making smart choices by serving themselves.

Source: HealthDay
 Related MedlinePlus Pages: [Child Nutrition](#)

[Read more on MedlinePlus](#)

05/23/2017 07:00 PM EDT

Electric Brain Stimulation No Better Than Meds For Depression: Study

Novel treatment may need to be tailored to each patient, mental health

For people who battle depression and can't find relief, stimulating the brain with electric impulses may help. But a new study by Brazilian researchers says it's still no better than antidepressant medication.

Source: HealthDay
 Related MedlinePlus Pages: [Antidepressants](#)

[Read more on MedlinePlus](#)



This email was sent to Email Address.
 Please click [here](#) to unsubscribe from this email list

 [Follow MedlinePlus on Twitter](#)

To change your subscription preferences or stop subscriptions anytime,
 log in to your [User Profile](#) with your email address.
 For questions or problems with this service,
 please visit [subscriberhelp.govdelivery.com](#).

This is a free service provided by [MedlinePlus](#) and the [U.S. National Library of Medicine](#),
[U.S. Department of Health and Human Services](#), National Institutes of Health.

Appendix D: Five Panel Newsletter Layout



HEALTH NEWS



05/23/2017 07:00 PM EDT

Getting Kids in the Habit of Healthy Eating

Try making good food fun at home

Want to help your kids make healthy food choices when you're not with them? Make every meal at home a lesson in good nutrition.

Start by showing them what goes into a healthy meal, ChooseMyPlate.gov from the U.S. Department of Agriculture suggests. Fill half their plate with fruits and veggies, one quarter with grains -- preferably whole grains -- and a quarter with protein, like lean meat, seafood, beans or tofu. Then let them practice making smart choices by serving themselves.

Source: HealthDay
Related MedlinePlus Pages: [Child Nutrition](#)

Read more on MedlinePlus

05/23/2017 07:00 PM EDT

Electric Brain Stimulation No Better Than Meds For Depression: Study

Novel treatment may need to be tailored to each patient, mental health expert says

For people who battle depression and can't find relief, stimulating the brain with electric impulses may help. But a new study by Brazilian researchers says it's still no better than antidepressant medication.

In a trial that pitted transcranial, direct-current stimulation (tDCS) against the antidepressant escitalopram (Lexapro), researchers found that lessening of depression was about the same for either treatment.

Source: HealthDay
Related MedlinePlus Pages: [Antidepressants](#)

Read more on MedlinePlus



05/23/2017 07:00 PM EDT

Community Intervention May Aid Fight Against Childhood Obesity

Harvard study finds small successes in two Massachusetts-based programs



Source: HealthDay
Related MedlinePlus Pages: [Child Nutrition](#), [Obesity in Children](#)

Read more

05/23/2017 07:00 PM EDT

E-Cigarettes Lead to 'Real' Smoking by Teens: Review

But one public health expert questions whether the reported association is valid



Source: HealthDay
Related MedlinePlus Pages: [E-Cigarettes](#), [Smoking](#), [Smoking and Youth](#)

Read more

05/23/2017 07:00 PM EDT

Fewer Americans Hospitalized for Heart Failure

But blacks still face far greater odds than whites, study finds



Source: HealthDay
Related MedlinePlus Pages: [Health Disparities](#), [Health Statistics](#), [Heart Failure](#)

Read more

This email was sent to Email Address.
Please click [here](#) to unsubscribe from this email list

Follow MedlinePlus on Twitter

To change your subscription preferences or stop subscriptions anytime, log in to your [User Profile](#) with your email address.
For questions or problems with this service, please visit [subscriberhelp.govdelivery.com](#).

This is a free service provided by [MedlinePlus](#) and the [U.S. National Library of Medicine](#), [U.S. Department of Health and Human Services](#), [National Institutes of Health](#).

Appendix E: Customized Email with a Blue Banner Layout





Hey everyone! Did you know that it is Diabetes Alert Day?

According to the National Institute of Diabetes and Digestive and Kidney Diseases, about 29.1 million men and women have been diagnosed with diabetes in their lifetime in 2012.

But what is diabetes?

Diabetes is a disease in which your blood glucose, or blood sugar, levels are too high. The symptoms of diabetes can appear slowly, and some people do not notice symptoms at all. But some of them are:

- Extreme hunger
- Extreme thirst
- Frequent urination
- Unexplained weight loss
- Fatigue or drowsiness
- Blurry vision
- Slow-healing wounds, sores or bruises
- Dry, itchy skin
- Tingling or numbness in the hands or feet
- Frequent or recurring skin, gum, bladder or vaginal yeast infections



Curious to learn how to prevent Type 2 diabetes? Read on.

Before people develop type 2 diabetes, they usually have "[prediabetes](#)" that means their blood glucose levels are higher than normal, but not yet high enough to be called diabetes.

Most people with prediabetes don't have any symptoms. Your doctor can use an [A1C](#) or another blood test to find out if your blood glucose levels are higher than normal.

[Losing weight](#) - at least 5 to 10 percent of your starting weight - can prevent or delay diabetes or even reverse prediabetes. You can lose weight by cutting down on the amount of calories and fat you eat and [being physically active](#) at least 30 minutes a day.

[Go to MedlinePlus](#)

Want to learn more? Here are additional resources on diabetes

[Link 1](#) [Link 2](#) [Link 3](#)



Appendix F: Customized Email without Blue Banner Layout




**Hey everyone! Did you know that it is
Diabetes Alert Day?**

According to the National Institute of Diabetes and Digestive and Kidney Diseases, about 29.1 million men and women have diagnosed with diabetes in their lifetime in 2012.

But what is diabetes?
Diabetes is a disease in which your blood glucose, or blood sugar, levels are too high. The symptoms of diabetes can appear slowly, and some people do not notice symptoms at all. But some of them are:

- Extreme hunger
- Extreme thirst
- Frequent urination
- Unexplained weight loss
- Fatigue or drowsiness
- Blurry vision
- Slow-healing wounds, sores, or bruises
- Dry, itchy skin
- Tingling or numbness in the hands or feet
- Frequent or recurring skin, gum, bladder, or vaginal yeast infections

Curious to learn how to prevent Type 2 diabetes? Read on.
Before people develop type 2 diabetes, they usually have "**prediabetes**" that means their blood glucose levels are higher than normal, but not yet high enough to be called diabetes. Most people with prediabetes don't have any symptoms. Your doctor can use an **A1C** or another blood test to find out if your blood glucose levels are higher than normal. Losing weight—at least 5 to 10 percent of your starting weight—can prevent or delay diabetes or even reverse prediabetes. You can lose weight by cutting down on the amount of calories and fat you eat and **being physically active** at least 30 minutes a day.

Want to learn more about diabetes?

[Go to MedlinePlus](#)



© 2012

This email was sent to Email Address. Please click [here](#) to unsubscribe.



Follow MedlinePlus on Twitter

To change your subscription preferences or stop subscriptions anytime, log in to your [User Profile](#) with your e-mail address. For questions or problems with this service, please contact [subscribehelp@medlineplus.gov](#).

This is a free service provided by [MedlinePlus](#) and the [U.S. National Library of Medicine](#), [U.S. Department of Health and Human Services](#), [National Institutes of Health](#). To contact MedlinePlus, see [our form](#).

Appendix G: Comparison of HubSpot, Granicus, and MailChimp**Table 5: Comparison of HubSpot, Granicus, and MailChimp**

Name	Pricing	Customize Emails	Segment Users by Topic	A/B Testing	Run Email Campaigns	Additional Features
HubSpot	<ul style="list-style-type: none"> • \$2,400 per month for 10,000 contacts (HubSpot, 2017) • One-time fee: \$5,000 (HubSpot, 2017) • \$10 added for each additional 1,000 subscribers (HubSpot, 2017) • Plan Subtotal: \$11,600 a month (HubSpot, 2017) 	Yes	Yes	Yes	Yes	<ul style="list-style-type: none"> • Send suggestions on how to optimize emails to engage subscribers more (HubSpot, 2017) • Create personas and receive a custom persona-based report (HubSpot, 2017)
Granicus	\$82,000 a year for the library	Yes	Yes	Not with current package	Done in conjunction with Google Analytics	<ul style="list-style-type: none"> • Email consultants can help create a customized email template • Generate Subscriber activity report • Can remove subscribers who have not opened emails in over 6 months

Name	Pricing	Customize Emails	Segment Users by Topic	A/B Testing	Run Email Campaigns	Additional Features
MailChimp	<ul style="list-style-type: none"> \$3,950 per month for 922,501-930,000 subscribers (MailChimp, 2001-2017b) 	Yes	Yes	Yes	Yes	<ul style="list-style-type: none"> A/B testing on up to eight variations of a single campaign (MailChimp, 2001-2017a) Email API to send emails (e.g. automated and personalized messages) (MailChimp, 2001-2017b)

Note: Costs could potentially change if subscribers who have not opened an email in 6 months are removed from the subscriber lists. Costs could also change if a tailored email marketing package is ordered that provides services that are appropriate for MedlinePlus staff and subscribers.